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The Population of the Tanjore District

By

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The Tanjore district can be divided into *four* distinct regions, from the point of view of the distribution of population. It is mainly due to the fact that the people of the district are mostly engaged in agriculture or allied occupations except perhaps in the urban areas; where there are facilities for employment of larger numbers of cultivators there is a greater congregation of ryots. The soil and the availability of water for irrigation restrict these conditions. Based on these two considerations, the four following divisions are worth noticing :—

1. *The Cauvery division* comprises the area cultivated under the Cauvery and the numerous channels supplied by it.

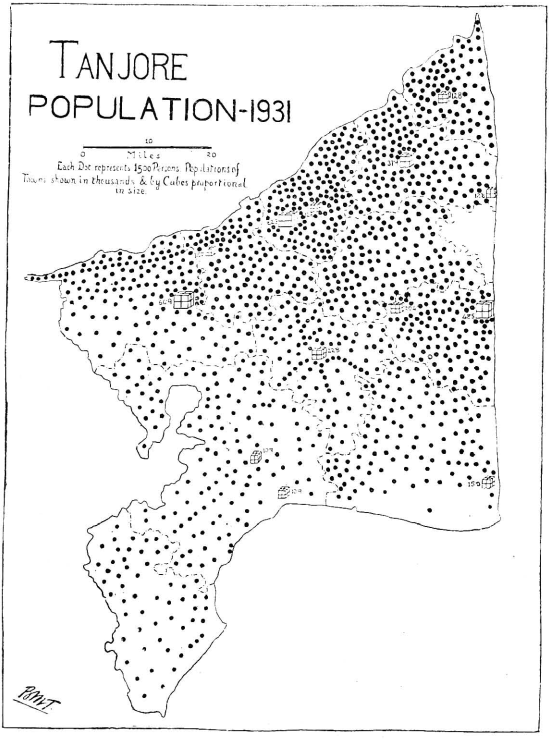
This area has a greater percentage of double crop cultivation, a small percentage of dry lands and the soil is either clay or clayey loam.

2. *The Vennar division* comprises the area cultivated under the Vennar and the many channels supplied by it. This area is mostly under single crop paddy cultivation. There is a greater percentage of dry lands and the soil is clay or *kalar* (களர்).

3. *The sandy and marshy tracts along the coast,* partly cultivated and mostly waste. In some cases this extends to even 10 miles from the coast. *The Vedaranyam swamp* in the S. E. of the district has a scrub-jungle along its outskirts and has saltpans near the coast.

4. *The upland portion of the Tanjore district* mostly dry or under tank irrigation, with the red soil in the southern parts of the district. A portion of this division is now under the Mettur Canal scheme of irrigation.

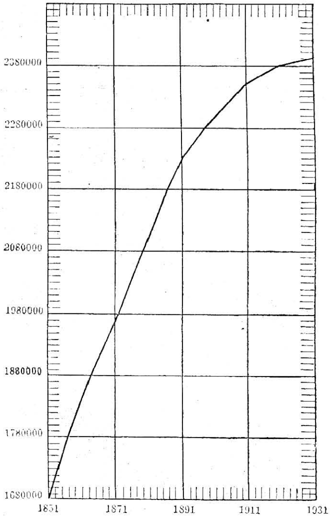
A reference to the figures and the map of the density of population clearly indicates that the Cauvery division is the most densely peopled, while the southern parts of the district are the most sparsely peopled.



This district has enjoyed peace and prosperity for ages under the Cholas, the Naicks, and the Mahrattas. It has had an excel-

lent irrigation system for the past 2,000 years and has been the home of culture and civilisation. In addition to these facilities, it has been the home of a greater percentage of Brahmins who early during the British occupation took to English education ; and thus this district has been favoured in course of time by a number of educational institutions that have helped it to grow still more.

Geographically, there are not many important relief features ; the temperature and rainfall are more or less uniform over most of the district ; and the whole district (except the southern dry lands) forms a homogeneous region in its general characteristics

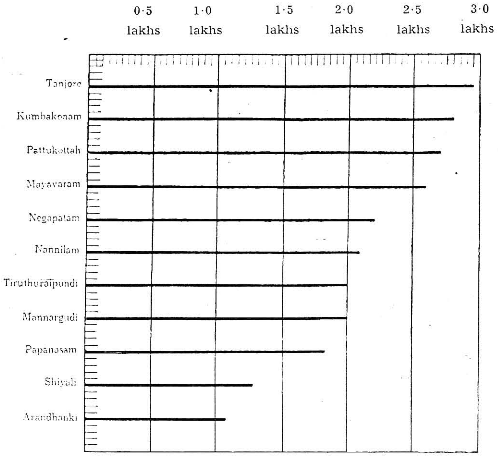


Variation in the Population of the Tanjore District during 1851-1931

and modes of living. There is not a single hill in the delta ; and the roads have to be maintained with kankar brought from outside the district mostly. The scrub-jungle in the drier parts do not deserve any special mention as they are practically useless except for firewood for local consumption. The only jungle of any note

is near the Vedaranyam swamp, where the District Officers usually go for a hunt. It abounds in deer, wild horse and ass of country breed. Cattle is permitted to graze in it for a nominal charge.

Apart from these areas, the rest of the district receives very good supply of water through the hundreds of canals that form a net work in the district. The rivers gradually dwindle into small streams and in many cases do not even reach the sea. But during



Comparison of the Population of the Taluks of the Tanjore District according to the census of 1931

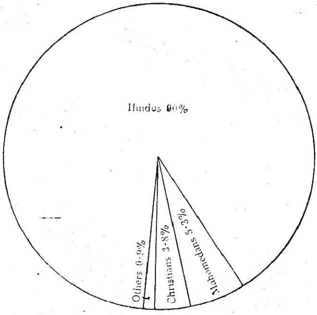
summer, the district presents a monotonous and parched appearance. It is only during the months from July to February that the district presents a pleasing sight with its green-paddy fields. Paddy is mostly the only crop raised on the fields under wet cultivation. Most of the paddy is exported either as paddy or as rice to other parts of the country ; and the poorer people of the district live on cheap imported rice. Like all rice areas of the world, this district is very densely peopled.

The density of the district is 638 persons per sq. mile. It is the second densest district in the Madras Presidency, the first being the East Godaveri district with a density of 660 persons per sq. mile.

But the latter is completely a deltaic area ; and comparing it to the Delta portion of the Tanjore district, it is easily seen (Refer to tables) that the most densely peopled agricultural area of the Presidency is the Cauvery delta with an average of over 900 persons per sq. mile.

Among the densely peopled taluks of the Presidency, Kumbakonam comes second with a density of 1,332 persons per sq. mile, while Ponnani ranks first with 1471 persons per sq. mile.

A glance at the variation of the total population of the District reveals the fact that it is already saturated, and that the ever-increasing population is emigrating either to other districts or to other lands. The educated people usually forsake their small holdings in the village and settle down in the suburbs of Madras and other cities, and the poorer people get away from the land as coolies to Singapore, Ceylon and other parts of the world where they may possibly go. Even the important towns of this district do not show any change in population during the last two decades, while many towns of the Presidency show a marked increase, *e.g.*, Madras, Salem, Trichy, Madura, Coimbatore, etc.



Distribution of Population as per religion

The Language of the district is Tamil. Even the Mahomedans of this district talk Tamil mostly. There are very few people whose mother-tongue may be mentioned as Telugu or Hindustani.

The preponderating religion of the district is Hinduism (90%) while Mahomedanism claims only 5·3% and Christianity 3·8%. The district has the highest percentage of Brahmin population 6·42 in 1901 and 5·6 in 1931 as compared to 3 per cent for the Presidency

as a whole. Kumbakonam is the centre for Brahminism in the district and to a great extent in South India. The percentage of Brahmins in this taluk is 18·36 in 1901 and 10 in 1931. Ethnologically there is very little difference between the people of this district and those of the other parts of the Presidency.

There are a number of communities, each engaged in its own occupation and each enjoying its own feasts and festivals, but forming a part of the homogeneous whole. There are no communal quarrels in this district. Highly criminal offences are very rare, but the courts are usually crowded with petty land disputes and unpaid and irrepayable debts.

The main agricultural communities are the Vellalars, Mudaliars, Pillais and Naickens. The Kallars of this district are also mostly engaged in agriculture, as also the Valayans, Pallans and Paraiyans. The Labbais and Marakayars are either engaged in the cultivation of betel or in trade, and belong to the Mahomedan faith. The Sourashtras form the weaver community of this district. They are gathered mostly in three places in the Presidency—Salem, Madura and Kumbakonam. Kumbakonam has the greatest percentage of this community as compared to Salem and Madura.

The health of the district is not of a high order. It has all the defects of a delta area and even after so many years of peaceful rule, definite and marked improvement is not noticed. The three South Indian pests—cholera, smallpox and fevers claim their quota from this district. Of these cholera is the worst as can be noted from the following figures:—Death per 10,000 due to:

Taluk.	*Cholera*	*Small-pox*	*Fever*
Kumbakonam	40	10	37
Mannargudi	33	10	18
Negapatam	75		
Mayavaram	39		
Nannilam	43		
Tanjore	32	11	45
Pattukkottai	13	8	15

Though there is a greater percentage of females over males in this district as in the case of several other districts, the abnormal preponderance of females over males among the Mahomedans

123 : 100 is " due to social life, widow marriages and free concubinage ".

This district can boast of greater percentage of educational people. Elementary and secondary education is well fostered, and literacy holds a fairly good rank as compared to the other districts of the Presidency. There are a number of high schools scattered over the district ; and the schools are usually packed with pupils, in spite of the fact that a large number go outside the district for educational purposes. But there is still room enough to improve the education of the people, to organise well-managed schools all over the district. There are still areas that have no schools within a range of 3 miles and this state of affairs should certainly be improved. There are, of course, facilities for improving the educational standard of this district.

Kumbakonam is the most important town of the district. It is centrally situated, is in the middle of the Cauvery delta and has been the home of religious and cultural revivals. It has grown to be the biggest market town of the district and has the only college of the district.

Vallam, Pattukkottai and Tranquebar are health resorts in the disrtict.

Tanjore is the District Headquarters, with all the district offices, hospitals etc., and is an important junction of the natural routes of the district. Hence its political importance from ancient days. It is situated between the drier and the wetter areas, and is a healthy town compared to the other towns of the district, especially those in the deltaic area.

Negapatam has been the centre of industrial activities from the early days of European trade and though there was a slight fall in its activities on the removal of the South Indian Railway Workshops, it is fast improving and may once more become an important industrial centre with the supply of cheap electricity from the Mettur and Pykara stations. The District as a whole is now rapidly making headway in small industries with the cheap electricity that is supplied to every corner of the district. With the improvement of cottage industries and small machine industries the population of the district may still increase and emigration may be arrested to a great extent. With greater prosperity to the agricultural people the population may show a marked rise.

POPULATION OF TANJORE DISTRICT.

No.	Name of Taluk.	Area in sq. miles.	Towns with over 3,000 people.	Villages.	Occupied Houses.	No. of Males.	No. of Females.	Total Population in 1931.	Density per sq. mile.
1.	Arantangi ..	398	2	595	23,658	52,117	58,574	1,10,691	278
2.	Kumbakonam ..	211	13	188	53,820	1,36,223	1,44,762	2,80,985	1,332
3.	Mannargudi ..	301	2	200	41,922	95,729	1,05,170	2,00,899	667
4.	Mayavaram ..	282	6	179	54,979	1,23,386	1,38,975	2,62,361	930
5.	Negapatam ..	240	6	203	48,058	1,04,549	1,15,987	2,20,536	919
6.	Nannilam ..	291	1	253	48,404	98,967	1,13,568	2,12,535	730
7.	Papanasam ..	230	7	177	36,453	90,037	95,694	1,85,731	808
8.	Pattukottai ..	700	6	468	53,125	1,35,458	1,43,179	2,78,637	398
9.	Shiyali ..	171	5	87	26,479	64,009	69,178	1,33,187	779
10.	Tanjore ..	422	8	199	55,385	1,47,205	1,52,037	2,99,742	709
11.	Tirutturaipundi ..	496	6	146	44,667	96,058	1,05,058	2,01,116	405
	Total ..	3,742	62	2,695	4,86,950	11,43,738	12,42,182	23,85,920	638

Population per sq. mile in some of the densely peopled districts of the Madras Presidency:

East Godavari	..	660
Tanjore	..	638
Malabar	..	610
S. Arcot	..	583
Chingleput	..	535
Vizag	..	534
W. Godavari	..	518

Population per sq. mile in some of the densely peopled taluks of the Madras Presidency:

	Density.	Area in sq. miles.
Ponnani	1471	426
Kumbakonam	1332	211
Madura	1237	267
Saidapet	1110	247

Distribution of the Population of the Tanjore District as per Religions.

No.	Name of Taluks.		Total in thousands.	Hindus.	Moslems.	Christians.
1.	Arantangi	..	110·7	90·7	13·7	6·2
2.	Kumbakonam	..	281·0	254·5	16·5	10·0
3.	Mannargudi	..	200·9	185·1	10·6	5·0
4.	Mayavaram	..	262·4	237·5	14·8	10·0
5.	Negapatam	..	220·5	191·0	21·1	8·2
6.	Nannilam	..	212·5	192·3	14·0	6·1
7.	Papanasam	..	185·7	162·6	16·8	6·2
8	Pattukottai	..	278·6	259·9	13·6	4·9
9.	Shiyali	..	133·1	124·2	6·1	2·8
10.	Tanjore	..	299·2	260·1	9·7	29·1
11.	Tirutturaipundi	..	201·1	189·7	8·4	2·8
	Total	..	2,385·7	2,147·6	125·3	91·3

Public Health of Kumbakonam in relation to Environment

By

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Kumbakonam is a low-lying place situated between two rivers, intersected by canals, and surrounded by wet fields and plantain gardens. It is in the deltaic area of the river Cauvery. The sub-soil water is very high ; and there are many pools, canals, tanks, and drains which, being filled with water, afford excellent breeding-places for mosquitoes.

In fact, Kumbakonam is nothing but a big village containing numerous trees and large collections of water. Most of the houses have extensive backyards and the town has plenty of conservancy lanes. These lanes run parallel to and between the streets ; and as there is no drainage system for the town, much of the sewage water is allowed to flow into these lanes. Added to this, there are many tanks attached to the temple. The beds of the rivers are higher in level than the town ; and many houses are provided with tube-wells for drinking purposes, as the sub-soil water is high. In some places water can be found within a few feet below the surface.

With a geographical situation stated as above, Kumbakonam has been found to be famous for its mosquito-bite, and filarial disease. Although the town has many diseases, commonly prevalent in other parts of the country, no disease has been prevalent to such a great extent, as filariasis. The infection is prevalent in various forms, such as, Elephantiasis leg, milky urine, swollen glands, fever and abscesses. As one passes through the streets of Kumbakonam, it will be a horrible sight to see every ninth or tenth person walking with elephantoid leg. People of all grades, rich and poor, strong and weak, young and old, all suffer from this loathsome disease. The town, though it contains a large percentage of educated people is still primitive in methods of living. People no doubt attend to their personal cleanliness, but are totally indifferent to their surroundings. They never mind bathing any number of times in the river to avoid pollution of touch, but will not care to remove their own kitchen water collected in their back-

yards in pits which breed innumerable mosquitoes. The educated and the well-to-do are great sinners in this respect. There are many retired officials in the town; and they rather like to live in the crowded locality, and be subject to mosquito bite and filarial infection than live in extensions and be free from these. Any amount of work done by the paid agency and local bodies will be useless, unless people co-operate with them by leaving their old customs and taking to new healthy ways.

It is one of the remarkable facts in animal parasitology that ever so many persons harbour filarial worms without showing any manifestation of the disease and all the same being potential dangers of infection. The worst infection has been found to be due to the bite of that kind of mosquito which is highly prevalent in Kumbakonam. These are present in cess-pools, drains, chatties, thrown out iron wares, disused wells and other water collections. Kill the mosquito, kill the disease. Apart from producing diseases, mosquitoes bite people at night and produce loss of sleep.

India has become famous in many ways. It was considered to be a land flowing with milk and honey. Equally so has it become a country harbouring deadly and poisonous animals and reptiles. Bengal tigers and King Cobras are proverbial. And in the matter of mosquitoes, the palm must be given to the Kumbakonam, which is considered the king of its kind in its bite.

METHODS EMPLOYED IN KILLING MOSQUITOES

The main object is not to catch the adult mosquito and kill it, as such a process is neither easy nor satisfactory. A simpler and more effective plan is to hunt out its breeding places and kill the young ones before they develop wings and fly. This is done by oiling the water collections where they breed. *Without water the mosquito cannot breed.* The young ones of the mosquito called Larvae and Pupae are destroyed in water by the application of an oil to its surface. The oil spreads over the water and does not allow the mosquito to breathe; and it dies of suffocation. As the development of the mosquito takes a week, oiling should be done once a week. The town of Kumbakonam is divided into six divisions; and oiling is done once a week in each division. The oil that is used is Malariol of Burma Oil Company; and when it is thrown on water, it spreads readily, and is poisonous to mosquito larvae. Kerosene oil is good, but more costly. Waste motor oil or Crude oil may also be used but it does not spread well.

The oil is sprayed on breeding places by means of a knapsack sprayer. By this means, the oil is sent to a distance of twenty to thirty feet from the operator. It is worked under pressure ; and the spraying is even. There is great economy in using these pressure sprayers. The oil kills the ova, larvae, and pupae of the mosquitoes.

We are having a staff of one Anti-Mosquito Inspector and two Maistries and a dozen coolies. We have a dozen sprayers and we spend nearly 7,000 to 8,000 Rs. per year. We have a separate staff of 10 people who go in advance and clear the cess-pools and canals before oiling.

In conclusion, I have to say that it was in the month of June 1935 that the Anti-mosquito campaign was started in Kumbakonam ; and this operation has been tried for nearly two years and this is a sufficient period to judge its efficacy. It is not a permanent relief ; and it can never be so. Unless a complete drainage system is evolved and sullage water is completely taken away from the town, this nuisance will continue. Then you may ask, " Why then waste money on this ? " The answer is simple. " Are people to suffer from mosquito bite and filarial infection till then ? " " Should they not have some relief ? " And this relief you find in this measure, which was originally started by the Late Dr. M. K. Sambasivan and continued with no less vigour after his death.

Only one aspect of the public health of Kumbakonam in relation to environment has been dealt with in this lecture and that aspect has been found to be more important than the others—I mean, the aspect of " Kumbakonam and its Mosquitoes."

The Economic Geography of the Tanjore District

By

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Shape and boundaries.—The Tanjore District lies on the south-eastern coast of the Madras Presidency between 9°.51′ and 11°.25′ north and 78.°47′ and 79.°52′ east. On the north the river Coleroon separates it from Trichinopoly and South Arcot Districts. On the west it is bounded by the Pudukota state and Trichinopoly, and on the south by the Zamindaris of Ramnad and Sivaganga. The sea-board on the east consists of two portions one extending in a long straight line directly south from the mouth of the Coleroon River to Point Calimere, and the other, (itself divided into two at Ammapatnam) curving thence west and south for 75 miles along the Palk Strait. The district is roughly triangular in shape.

Natural divisions.—Tanjore is made up of three clearly marked natural divisions consisting respectively of (*a*) the delta of the Cauveri (*b*) the upland tracts of the Tanjore, Mannargudi, Puttuk-kottai and Arantangi taluks, large portions of which have been reached by the Mettur dam canal. (*c*) the salt swamp.

(*a*). The delta of the Cauveri is a large alluvial even plain of paddy fields, diversified only with groves of cocoanuts, mangoes and other trees, which slopes gently to the sea, and is devoid of natural eminences save the hillocks and ridges of blown sand which fringe the narrow strip of beach along the coast. The sea rolls upon a shelving sandy shore unbroken by rocks of any kind and the coast is monotonous in aspect.

(*b.*) The upland tract though more elevated than the delta is likewise an open plain sloping towards the last and is similarly destitute of hills except where south and southwest of Tanjore the country rises above the surrounding level and forms a small plateau, broken by ridges of grit and sandstones which is known as the Vallam table-land.

(*c*). The tract spreading over 30 miles from Point Calimere to Adiramapatnam is the great Vedaranyam salt swamp. Its general width is four to five miles and it is the largest area of this kind in the Presidency. It is filled by two periodical high tides

which occur in May and June and which create the well-known Vedaranyam spontaneous salt.

Hills.—There are no hills whatever in the district and no height is anywhere recorded of over 160 feet above sea-level. The Vallam table-land is the highest portion of the country.

Rivers and Canals.—The Cauveri and its offshoots are the principal rivers which cover the whole of the delta with a vast network of irrigation channels. Most of these are navigable for a few miles from the coast by small boats, but only three of them have harbours at their mouths. These are the Adappar which forms the harbour of Thopputhurai, the Uppanar on which the ports of Tirumullavasal is situated and the Koraiyar which connects the harbour of Muttupet with the sea. Most of the other large branches of the Cauveri were navigable at one time and were much used by boats. Canals have been dug along the coast from Negapatam to Vedaranniyam and from Tranquebar to Tirumullavasal and were used for traffic in the past but are no longer of much use.

The fall of the Cauveri, above the delta is 3.4 ft. per mile and within the delta is 2·7 ft. per mile. The beds of the Cauveri and all its branches are sandy.

Outside the delta the only rivers are a few in the Pattukkottai and Arantangi Taluks, which are torrential in character and are of very small importance. Some of them feed irrigation tanks.

Sea-ports.—There are eleven ports on the coast of the Tanjore District, which are of varying importance:—Tirumullavasal, Tranquebar, Negapatam, Velanganni, Topputhurai, Point Calimere, Muttuppet, Adiramapatnam, Kodiyampalaiyam, Kattumavadi and Nagore. The anchorage is good at all these places but the shoals which lie nearby make it necessary for big ships to anchor at distances varying from one to four miles and to unload goods to the shore in cargo boats of varying sizes up to ten tons burden.

Soils.—Four main classes of soil are found in the district. (i) the alluvial occupying 27 percentage of the total area, (ii) the red ferruginous 21 per cent, (ii) the arenaceous 1 per cent and (iv) the regular black 45 per cent.

Action of the Sea.—At Kaveripatnam, Tranquebar and Negapatam erosion of the sea-coast is going on. No further deltas are forming near the mouths of the rivers.

Minerals.—The district is poor in minerals except for some iron to be found in the laterite rocks of the uplands (not now exploited) and some quartz products near Vallam called Vallam stones. Laterite is found at Vallam and Gandarvakottai and is largely used for building purposes and for metalling roads. Limestone is found in large quantities and is used for making mortar and stucco.

Climate.—There are wide variations in the rainfall, temperature, humidity and winds in the different parts of the district. The average rainfall (1870-1930) in inches for the whole district is 45·92 and for places in Taluks is as follows :—

Kumbakonam	.. 42·55	Mannargudi	.. 47·67
		Nidamangalam	.. 43·65
Papanasam	.. 39·27		
Valangiman	.. 42·45	Tirutturaipundi	.. 47·06
		Muttupet	.. 49·04
Negapatam	.. 54·65	Vedaranniyam	.. 59·58
Tiruppundi	.. 55·74		
Tiruvarur	.. 52·01	Arantangi	.. 32·22
		Kattumavadi	.. 31·75
Kodavasal	.. 47·13		
Nannilam	.. 48·91	Adirampatnam	.. 40·31
		Pattukkottai	.. 41·97
Mayavaram	.. 50·62		
Naidavasal	.. 54·51	Grand Anicut	.. 31·24
Tranquebar	.. 53·09	Tanjore	.. 36·78
		Tirukattupalli	.. 38·49
Shiyali	.. 59·69	Tiruvadi	.. 39·54
		Vallam	.. 39·36

The heaviest annual falls recorded between 1902 and 1920 were at Shyali in 1913 103·26 inches, Neduvasal in 1913 88·87, Tiruvarur in 1884 88·2, Tranquebar in 1913 87·16, and Negapatam in 1913 85·79. The poorest falls were at Arantangi in 1882 16·60, Tanjore in 1904 18·42, Tirukattupalli in 1904 20·36, Kattumavadi in 1907 21·23, and Tiruvadi in 1904 23·23, inches.

Flora.—Fruit trees are plentiful, the mango, cocoanut, tamarind and jack being the types. Others like the palmyra, cashew, and nagai are less common. Avenue trees consist of figs, margosa, and puvarasu. Topes contain Illuppai and bamboo.

The people.—There is great variation in the growth of population from decade to decade and greater variation in the density of population in taluks. The census figures for the district are

1931	1921	1911	1901
2,385,920.	2,329,915.	2,362,689.	2,245,029.

The greatest density is in the Kumbakonam taluk with 1,300 per sq. mile.

Agriculture and irrigation.—Agriculture is the main occupation of about 60 per cent of the people of the district.

Percentage of the total area cultivable.	72·0
do. do. cultivated.	56·0
Percentage of cultivable area cultivated.	77·8
do. do. double cropped.	7·7
Percentage of cultivated and irrigated area.	73·0
Rainfall of the district.	46·33″

Percentage of gross cultivated area under :—

Paddy	.. 74·7
Cholam, Cambu and Ragi	.. 3·6
Other food crops and pulses	.. 10·0
Groundnuts	.. 6·0
Cotton	.. 0·1
Other crops	.. 5·6

CLASSIFICATION OF AREA AND PRINCIPAL CROPS (1930-31)

	Acres.
Government (Ryotwari and minor inams).	1,666,691
Whole inam.	528,599
Zamindari.	190,925
Total.	2,386,215
Forests.	12,460
Not available for cultivation.	541,713
Cultivable waste other than fallows.	45,203
Current fallows.	225,026
Net area cropped.	1,192,849
Area shown in village accounts.	2,017,251
Area irrigated by Govt. canals.	823,411
Do. by tanks.	87,832
Do. by wells.	11,179
Do. by other sources.	2,308
Total.	924,730

	Acres.
Oil Seeds.	
Gingelly.	14,021
Goundnut.	60,967
Castors	502
Others	37,443
Total	112,938
Condiments and Spices.	
Sugarcane	984
Cotton	1,588
Indigo	162
Total.	2,734
Drugs and Narcotics.	
Tobacco	1,803
Others	2,262
Total.	4,065

Area under Cereals and Pulses.

	Acres.
Rice.	1,026,143
Cholam.	12,858
Cambu.	8,513
Ragi.	26,773
Others.	76,851
Total.	1,150,638

Fodder crops.

	Acres.
Orchard and garden products	73,288
Miscellaneous, non-food crops	5,221
Total area cropped.	1,300,832
Deduct area cropped more than once	107,983
Net area cropped.	1,192,847

It may be observed that paddy cultivation is the largest and cotton cultivation the least. Groundnut occupies a very subsidiary position. Paddy cultivation is mainly by irrigation and transplantation. Many varieties of paddy are cultivated and the help rendered by the Government Agricultural Farm at Aduturai in evolving better strains of paddy, reducing the seed-rate per acre and improving the yield per acre is incalculable. Besides paddy, the crops on wet lands are sugar-cane (in widely increasing areas from 1931), betel-vine and occasionally plantains. The crops on dry lands are ground-nut, ragi, cambu, a little bit of red gram and black gram, a small bit of cotton and in general casuarina. On the padugai lands which lie silt-laden on the banks of rivers, plantains, bamboo and tobacco are grown.

Irrigation is afforded by the Cauveri and its numerous branches and by some tanks in the dry taluks. In 1932 there were 1258¼ miles of main canals and 3205 miles of distributaries in the delta. The Mettur project, which was primarily intended to assure the supply to the age-long deltaic irrigation of 1,000,000 acres and to act as a flood regulator to prevent the inundation of the delta, will be utilised on a fresh extent of 258,000. acres under the Grand Anicut canal system and for 43,000 acres of extension under the Vadavar system.

Indebtedness of the ryots.—It is a tragic irony that in spite of the richness of the yield and the fertility of the soil, the indebtedness of the ryot in the delta tract is far greater, relatively, than that of the ryot in the dry areas and absolutely great by itself, but the spread of the co-operative movement has greatly helped ryots by lowering rates of interest and offering credit facilities.

Emigration.—There is movement of population from the district to other districts in India and to regions outside India. The approximate figures for 1931 are:—

Ceylon.	Malaya.	Burma.	U.P.A.S.I,	Approximate. total.
84,667.	60,651.	24,994.	95.	170,400.

The Forest Area of the district is only 10.5 sq. miles confined to the Tiruturaipundi taluk. The Kodiakadu reserve with an area of 3,645 acres and the Talainayar reserve with an area of 3054·83 acres yield a revenue of about Rs. 5362 and involve an expenditure of about Rs. 16.53.

Fauna.—Cattle, sheep and goats are the only native animals besides ponies in small numbers. Jackals and foxes are to be found everywhere. Pig, antelope and spotted deer are found in some parts. Birds of some varieties are met with and fishing can be had in the sea and estuaries. Poisonous and non-poisonous snakes are also to be seen.

Occupations.—*Agriculture* is the major occupation employing and supporting about 60 per cent. The proportion of the people subsisting by the care of animals is about 2 per cent.

Weaving.—The textile industries of the district have long been famous. Weaving of pure silk is carried on in Tanjore and Kumbakonam, while weaving of cotton stuff and of mixed silk-cotton, silk and artificial silk is the occupation in many parts of the district. The dyes used are almost invariably imported mineral dyes.

Wax-printing is carried on at Kumbakonam, Negapatam and suburbs.

Two confectionery manufacturing factories have been at work at Shyali and at Kumbakonam rapidly rising to prominence.

Mat-making on a large scale (Rs. 3,000 worth, a month) is in progress at Ayyampet and on a smaller scale in most parts of the delta.

Metal-work.—Images for worship and for exhibition are made in Tanjore; and vessels of brass, copper, lead, and bell-metal are made for domestic use and are largely exported from Nachiarkoil

and Kumbakonam. About 10,000 tons of brass sheets are imported from Madras every year for being made into domestic vessels.

Other fine-arts.—Jewellery, painting (from the 10th century A.D.), pith-work, rattan work, musical instruments, wood-carving and moulding are being carried on in particular parts of the district.

Miscellaneous.—Rope, oil, tanning, baskets, bangles, shoes, scents, building and printing are of minor importance.

Other minor industries.—Inlaid silver-ware, chalk-works (Kumbakonam) pottery, and steel-trunks (Negapatam) are of local importance and command a good market.

The removal of the S. I. R. locomotive, carriage and waggon workshops from Negapatam to Golden Rock-Trichy has deprived the district of a major industrial occupation centre, but the creation of the Negapatam steel rolling mills may be taken as a small substitute.

Rice-hulling is an important industry scattered all over the district with about 60 major mills and a large number of minor mills.

Trade.—The trade of the district consists chiefly of the export of foodstuffs (principally rice) and the import of articles of luxury and comfort. Exports to other districts consist of silk and cotton fabrics, metal ware, tobacco and groundnut.

Trade of Negapatam Harbour 1930–31.—The total values of exports and imports both coasting and foreign are Rs. 1,04,60,716 and Rs. 35,75,166 respectively. The chief articles of export were (1) grains valued at Rs. 13,46,785 of which a large quantity went to Ceylon (2) live-stock worth Rs. 41,670 to Penang and Singapore (3) cotton and silk piece-goods to the value of Rs. 8,72,630 mainly to the straits settlements (4). Tobacco, manufactured and cigars valued at Rs. 8,74,450 to the straits settlements (5). Ghee to the value of Rs. 4,58,178 of which nearly the whole was to the Straits and (6). Groundnut to the value of Rs. 45,01,939 to European ports. The total value of the export trade to places outside India was Rs. 1,03,60,866 and goods to the value of Rs. 99,850 were shipped to places in India. The chief articles of import from outside India were (1). Betelnuts valued at Rs. 41,82,217 from the Straits and Ceylon (2). Cotton and piece-goods worth

Rs. 66,814 from the Straits (3). Gunny-bags worth Rs. 25,208 and Benzoin worth Rs. 57,776. The total value of the import trade of all kinds' from all places outside India was Rs. 10,03,958 and goods to the value of Rs. 25,71,208 from places in India.

In the *minor ports* of the district at Velanganni, Topputurai and Ammapatnam trade was practically extinct in 1931. Steamers call occasionally at Tirumulavasal for export of rice to Ceylon. Burma teak is imported into Tranquebar by steamer. Adirampatnam carries on a small trade by means of sailing craft with Jaffna in chank shells and coral as imports and rice and live-stock as exports.

No statistics are available for trade by rail.

In conclusion, it may be pointed out that the development of small industries with the help of cheap electric power from Pykara and Mettur is a great desideratum to give an economic balance to the life and activities of the people in the district.

A Note on the Agricultural Geography of the Environs of Tanjore

By

Mr. K. S. Gopalan, B.A., L.T.

Cultivation of land in Tanjore district as elsewhere is of two kinds—wet and dry. In the deltaic region we find wet cultivation, and in the non-deltaic area dry cultivation predominating. The main wet crop is paddy. Plantain cultivation is of secondary importance; and it is grown as a money crop.

There are two main kinds of paddy-fields. They are the single and the double crop fields. The transplantation for the single-crop field, takes place a little later than that for the first crop of the double-crop fields. This crop is harvested a little earlier than the second crop of the double-crop fields. In the double-crop field, soon after the first harvest the fields are again ploughed and planted with seedlings for the second crop. The first crop is an inferior kind of paddy. Where there are irrigation facilities, single-crop fields are converted into double-crop fields. The money value of the double-crop field is greater than that of the single-crop field, since it nearly yields double the quantity of the latter.

Ploughing begins in the month of July, when the rivers are full of freshes. The sight of the floods in the rivers sets the whole population to work. The fields are ploughed and sown with seeds. They are fertilised with green leaves and other fertilisers like oil-cakes, cowdung and other chemicals. The transplantation season begins about a month later. In the case of the single-crop lands, the harvest commences in October; and in the case of the double-crop lands it begins in January, *i.e.*, four or five months after the first harvest is over. The first crop, being a rough kind of paddy, is usually sold away or reserved for paying the servants who work on the land.

Paddy is the chief source of income to the people of the region. There are many *Mirasidars* or land-holders, who have grown rich on account of the income they get from lands. Most of the paddy is used for home consumption. The rest of it is exchanged within the district for dry crops. People from the South-West are the chief purchasers of the paddy. They bring with them dry grains

such as kambu, cholam etc., as well as Jack fruits, ground-nuts, wooden planks, firewood etc., from their places, and sell them in the big market of Tanjore, purchase paddy with the proceeds and return home.

Plantain cultivation comes next in the order of importance among the products of the wet lands. Large areas of paddy fields are brought under plantain cultivation on account of their greater money value. Areas on the river margins abound in plantain cultivation. A plantain tree is useful in many ways. Its fruits, leaves and tender stems are collected and sent to the chief market in Tanjore wherefrom outsiders purchase them. It is the chief money crop, just as paddy is the principal food crop. There are numerous varieties, such as *Monthan* used for curry purposes, *Poovan*, *Rasthali* and *Peyan*, which are useful as fruits. They are very delicious to eat. Plantain leaves are very famous in Tanjore, and they are sent to many places in the district.

Betel is the next important money-crop ; and as in the case of the plantain, large tracts of paddy fields are brought under betel cultivation. The silt brought by the freshes in the rivers is deposited in the river-bed and beyond the embankments. The soil is thus self-fertilised year after year with the coming in of the new flood, and is specially suited for betel-growing. These lands are distinguished from the others by the name '*Padugais*'.

Betel trade is a flourishing concern in this locality. The betel-collecting centres are very near railway stations. Chief among them are Ayyampet, Pandaravadai and Papanasam. Almost every day about Rs. 1,200 worth of betel is sent to other places from Tanjore, and many people have grown rich by pursuing this occupation.

Other wet crops are *sugar-cane*, *tobacco* and *vegetables*. They are all rotation crops. *Agathi* is a kind of tree which yields good manure for the paddy-fields and betel gardens. It is also a food for cows ; and people use it as a green vegetable.

The dry crops are, as has been already pointed out, grown in the non-deltaic region. They depend to a very large extent on irrigation. They are grown on lands which are higher than the river beds. Principal among them are cereals like kambu, varagu, cholam, ragi and maize. We find some of these dry crops here and there in the midst of wet fields also. A good area of these dry

lands has been recently brought under the irrigation of the Mettur canal. All lands south and south-west of Tanjore are converted into wet lands under this system.

Dholl is the chief money-crop among the dry crops. Vallam abounds in red ferruginous soil, which is favourable for the cultivation of this crop. Hence, we find large quantities of dholl grown there. Groundnut, gingely, castor-seeds, black and green grams are all grown; but they are not able to meet the demands of the region.

Irrigation facilities.—The whole area of the delta is covered with a network of canals. The Cauvery and the Kodamurutti, the Vennar and other branches are the principal feeders. They irrigate the lands both to the right and left by means of canals. The irrigation season commences from the beginning of July and lasts till December. The Public Works and the Revenue Department control the irrigation by framing definite rules and regulations. They take care to distribute the water according to the area and the crop cultivated. The Mettur reservoir has assured a steady supply of water to the deltaic parts, and has helped to bring a good part of the higher dry lands in the south under cultivation.

The Agricultural Geography of the Environs of Tanjore described above in this note holds good in general for the greater part of the Tanjore District, especially the deltaic area.

Human Geography of Tanjore and its Environs

By

Mr. K. S. Gopalan, B.A., L.T.

Introduction.—Tanjore, the capital of the district that bears its name is a town of hisoric importance. It is one of the ancient towns in the Tamil country, and is a place noted for the existence of many a ruling dynasty, such as the Cholas, Nayaks and Mahrattas, which had risen, flourished and decayed. Thus politically, it has been an independent unit for a long time. Geographically viewed, it affords much opportunity for an intensive study, being a separate and distinct physical unit, most fertile, occupying the central position of the Cauvery delta.

Position, Extent and Boundaries.—Tanjore lies south-west of Madras at a distance of 212 miles. Its length from North to South is three miles and from East to West is two miles. Its boundary on the north is the River Vennar. On the east it touches the limits of the Taluk boundary. On the south, it is bounded by the limits of Pattukkottai and on the west by Vallam and Pillayarpatti.

Physical Features.—A glance at the contour lines in the ordinance survey map reveals that the region under consideration is almost a plain one. The land slopes from west to east on the one side and from south to north on the other. Hence we find the main rivers and their tributaries flowing from west to east. In the southwest we find the land rising to its highest limit.

Geology and Minerals.—Geographically Tanjore can be divided into two parts. (1) In the south and south-west and on the western border, we find the hard red ferruginous soil. (2) As we proceed towards the north and east, the soil becomes more and more alluvial, probably due to the rivers flowing in that direction. It is interesting to note the relation between the nature of the soil and the depth of the sub-soil water. Water is at a great depth where the soil is hard. It is approximately at a depth of 30 feet. But in the north and east, where the soil is loose and soft and where the rivers flow, we find water nearer the surface.

Minerals.—Tanjore is practically poor in minerals, but for the Vallam Quarry which supplies laterite and pebbles, the former being used for road-metalling while the latter are utilised for making spectacles.

Temperature and Rainfall.—The climatic conditions of Tanjore depend on various factors. May is typically a hot month when we have 88° F. At this time, we find the absence of water in the rivers also. The absence of water in the rivers, the hot winds prevailing at this time and the scorching heat of the noon day sun all contribute to the growth of many diseases like small-pox, chicken-pox, boils and itches. At this season, cattle die in large numbers due to cattle diseases.

The presence of water in the month of June due to the South-west Monsoon moderates the temperature. As the winds cross the Western Ghats, they become dry. These dry winds affect the health of the people. Sore eyes and itch are the common prevalent diseases. Till October the mean temperature is 82.0 F.

The next period commencing from November marks the setting in of the North-East Monsoon. This is generally the prevailing cold season here. Heavy dew falls throughout the year and people suffer from cold, cough and fever. Cholera breaks out then on account of the peculiar temperature conditions and the use of the contaminated water of the river and its channels.

Rainfall:—A glance at the Rainfall chart reveals that from March to June, there is practically very little rainfall. The region gets the heavier rainfall in the month of November, while there is moderate rain from July to December. The rainfall is less in the months of January and February.

Vegetation.—The natural vegetation of this region belongs to the scrub jungle of the hydrophyte family. Many of these lands are brought under cultivation.

Population.—Nowhere is the density of population in this province so great as in Tanjore. The figures from the census reports are as follows :—

Year.	Males.	Females.	Total.
1911	28,777	31,561	60,338
1921	29,353	30,560	59,913
1931	33,560	33,292	66,852

The figures in 1921 as compared with the figs. obtained in 1911 show a gradual decline in population while that of the year 1931 shows a substantial increase. The former can be attributed to the economic depression consequent on the war conditions while that of the latter may be due to the comparatively better conditions.

Tanjore is populated by people of various communities. Hindus form the bulk of this population. Among them there are various communities such as Brahmins, non-Brahmins and depressed classes. A large number of Muslims are also found, but they are in a minority. Tamil is the main vernacular. It is universally spoken by all. Telugu was of great importance during the time of the rule of the Nayak monarchs. Marathi is spoken by a large number of people who are of royal descent. A class of weavers in Maharnombuchavadi speak a peculiar tongue and they are called Pattunullkars.

Place Name.—There are divergent views with regard to the origin of the name "Tanjore". Some are of opinion that the place was named in honour of a demon called Tanjan, who when he was about to die at the hands of Vishnu, requested him that the place be named after him. So the place is called Tanjore or Tanjanur after him. Some others are of opinion that Tanjore afforded shelter to all and so it was called Tanjore. The truth probably lies between the two extreme views.

Occupation and Industry.—The occupation of the people of this region depends on the nature of the soil, the presence of water in the rivers and on the nature of the rainfall. Agriculture is the mainstay of the people. It provides large numbers of labourers with employment. During the transplantation season, wages go high and there is a demand for a number of labourers even from the outside of the district.

Agriculture is of two kinds—*wet and dry.* In the Deltaic regions, we find wet cultivation and in the non-deltaic dry cultivation. (Further details regarding agriculture are given in a separate note.).

Subsidiary occupations.—Within the municipal limits, various occupations are being carried on. Each class of people has developed a particular branch of industry in its various aspects. *Silk weaving* has been developed to a remarkable degree. Probably this particular type of industry might have owed its origin to

royal patronage. Maharnombuchavadi, a part of Tanjore town has attained its speciality in this industry. The whole of the above-mentioned place is occupied by a class of people called 'Pattunulkars' who have become rich on account of this industry. They have invested a good deal of capital; large numbers of women, children and men are employed in this industry and they are proud of this trade. Spinning, dyeing, and hand-weaving are all carried on side by side. There are types of weaving such as mixed silk and cotton and pure cotton. Carpet weaving is another kind which is done at the Borstal School. It is not so important as silk weaving.

Painting is another kind of industry connected with the fine arts. Images of Gods and heroes are painted in brilliant colours on glass. A particular class of people known as 'Rajus' has developed this industry to a considerable perfection. They have been painters from a very long time. During the time of a festival known as Muthu Pallakku, they construct beautiful and wonderful Vimanams out of glass pieces which amply bear testimony to the artistic excellence displayed by this class of people. This festival day attracts a large number of crowd from the neighbouring parts. The Raju ladies take delight in embroidery work, especially in making embroidered caps, pillows and velvet cushions. They also make princely uniforms out of velvet and lace.

Making Jewellery is another important occupation. Tanjore goldsmiths are noted for their high craftsmanship in making gold and silver jewels. They are equally skilful in making engraved plates wherein they carve out wonderful life-like figures which are likely to attract the attention of ordinary laymen.

Basket making and screen netting are carried on to a very large scale in Tanjore. The backward classes make mats and baskets out of bamboo fruits. Their livelihood depends on this industry.

In Pookara Street, trade in flowers and in big chillies familiarly known as *Kudamulagai* is carried on. This provides a large number of people with employment when the harvesting season comes to an end. It thus provides them with part-time occupation. Tanjore roses and jasmine are very famous. They are collected together and brought to the daily market known as chanthai (meeting-place) for sale. Big chillies are useful for making pickles. They are sold in bags of a thousand each.

Perfumery is another chief industry in Tanjore which bears testimony to the splendour of the oriental monarchs. On account of the absence of royal patronage the industry has lost its ancient importance. Still in almost all parts of the town, scented sticks, rose attar and flower scents are manufactured on a very large scale. Kumbakonam compares favourably with Tanjore in regard to the perfumery industry. The Muslims of the city take a particular interest in developing this industry.

The soap industry of Tanjore is of recent growth. There are more than ten or twelve soap factories each with a separate trade mark. But raw materials have to be imported.

Imports and Exports.—Paddy is grown mainly for home consumption. A decade ago it was exported to Travancore and Ceylon. But on account of the competition of rice from Burma, there has been recently a fall in the price of paddy. Besides, Burma supplies the above places with paddy at comparatively cheaper prices than Tanjore.

Betels, plantains, tobacco, flowers and vegetables are the chief articles of export. The important articles imported here are mainly groceries. The fact that articles of export are relatively a few in number indicates that Tanjore is not commercially great and that its natural resources have not yet been fully developed, though there are great possibilities for improving them.

Communication.—Tanjore is connected with all parts of the District by means of railways and roads. It is a junction station on the Madras-Dhanushkodi line. A branch from here runs to Negapatam, which is a seaport town. All places in the district are less than 55 miles from Tanjore; Trichinopoly is only twenty-five miles West of Tanjore and Kumbakonam only 25 miles East of Tanjore. The important betel and plantain collecting centres such as Ayyampet, Papanasam and Pandaravadai are located on this line.

A series of metalled roads connect Tanjore with all the important places in the district. The Tanjore-Trivadi Road is spread with maxphalt. There is a regular bus-service on all these roads competing with railways as a result of which the cost of transportation and conveyance has been considerably reduced.

The rivers and canals serve as highways for conveying bamboos, plantain leaves, fruits and stems. These are carried on by

means of rafts when the rivers are full of water. The cost of communication is cheap but there is also a danger lurking in it. Plenty of care should be taken before setting afloat the raft. The articles above the raft should be properly arranged and tied tightly.

The *problem of housing* as a result of the rise in population is engaging even now the attention of the municipality. The scrub jungle areas adjoining the town are being reclaimed for housing purposes. As a result of the rise in population, the town is progressing by leaps and bounds. The Pookara Street, Ganapathinagar Agraharam, and the town extensions are of recent growth. Many of the retired officials and Government servants reside here. Being provided with plenty of sanitary arrangements, the rent in these places is considerably high and is bound to become higher and higher. Being on a much higher level than the town itself scarcity of water is felt here considerably.

Water supply.—Tanjore gets its water-supply from the river Vennar. The pumping station is located on the right bank of the Vennar just to the west of the main bridge. The pumping of water has to be done from a lower level to a higher level. When the river is completely dried up during the period from March to June, water has to be pumped out from springs in the river bed, and consequently there is some scarcity of water. But the scarcity is not serious and can be got over easily.

Places of Interest—Palace.—Let us now take a trip around the town and note down the chief places of interest. Going towards the East, the first thing that strikes us is the grand palace, which is a remnant of the Mahratta rule of Tanjore. The palace is a very spacious building. It has got seven floors. It is fortified by great walls and deep moats on all sides.

Inside the palace, we find may halls. The Sarabhoji Mahal otherwise called the Statue Hall contains a marble statue of Saraboji, a Mahratta ruler of Tanjore. The statue is a fine piece of wonderful workmanship. In the court hall, we find a number of painted pictures of the various monarchs with their coat of arms and their hunting dress. The Saraswathy Mahal was the Royal Library during the Mahratta rule. All the ancient Sastras and Vedas, and Mahrathi works have been collected and preserved here.

The members of the royal family especially the descendants of Saraboji are all given pensions by the British Government.

They have also got the right of collecting a kind of tax known as Mohini from certain villages in the district. Part of this collection goes to the maintenance of certain temples and the rest goes to the royal family. The members of the Royal family are staying in the palace itself. Some of the remaining portions in the palace are converted into Government offices.

Big temple.—The Big temple is a wonderful specimen of South Indian architectural and artistic excellence. It was built during the time of Raja Raja the Great. It is also called the Brahatheeswara temple. The inner gopuram of this temple has been constructed on such a plan that the shadow of the temple dome never falls on the ground. The temple is managed by the Tanjore palace estate authorities.

Sivaganga Fort.—This lies in the south-west corner of the great fort. It is also called the little fort of Tanjore. It encloses within it a tank which contains mineral water, the Sivaganga garden now converted into a public park and the Schwartz Church called after its founder Schwartz. Within the Schwartz Church there are grave-yards and inscriptions. The Sivaganga tank contains water which is pure and healthy. The tank supplies drinking water for the South-western corner of the town.

Churches and their importance.—The existence of the separate churches for the Roman Catholic, the S.P.G., the Leipzig Evangelical Mission and the Wesleyan Mission and the respective schools run by them bear witness to the keen interest taken by these bodies in fostering their religion and developing education.

Conclusion.—We have so far studied about Tanjore and its Environs from a geographical point of view; and we have seen that the region has great possibilities of improvement, as it lies in the midst of the fertile delta of the great South Indian river, the Cauvery. At present its natural resources have not been fully developed. Still, the city is second to none in the Presidency in its handicrafts and fine arts for which it has always been famous.

A Note on the Communication-lines and Transport in the Tanjore District

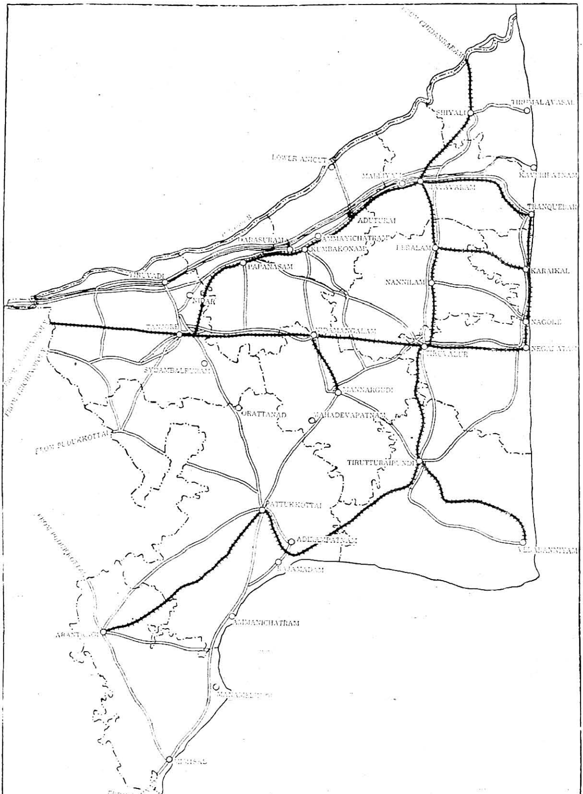
By

Mr. N. Subrahmanyam, M.A., L.T., F.R.G.S.

The District of Tanjore is particularly well supplied with roads and railways, whose mileage is by far greater here than in any other district. It is proposed to discuss in this short paper first the pattern of the communication-lines, both roads and railways in the District as well as their particular trends in the different parts of it with the reasons therefor, then the general condition of the roads with the underlying geographical causes for such, and finally the place of water transport in comparison with the other deltaic tracts in the Presidency.

Let us first take up the routes in the District in a general way. It will be seen from the map that the main S. I. Ry. line, which links up the northern districts with the southern, crosses the Coleroon, and after passing Shiyali keeps fairly close to the Cauvery from Mayavaram to Ayyampettai. From there it crosses the smaller branches of the main river and the Vadavar and reaches Tanjore. From this place it runs due west to Trichinopoly along the upland bordering the river in the south. Such an alignment happens not only to be a short-cut, but has also ensured for the railway fewer crossings over the numerous river-channels and a better traffic, as it links up the important towns lying along the main Cauvery.

The corresponding road, which connects the northern and the southern districts, keeps close to the main railway line only from Aduturai to Tanjore ; for, after the destruction of the road bridge over the Coleroon leading to Chidambaram, the Lower Anicut has been the only crossing for road traffic northwards beyond the District. Even from there a round-about route has to be taken through Udayarpalayam, as the straight road northwards to Shetiatope is in a woefully rotten and neglected condition. Hence, people who have to go to Madras from within the District by means of motor-cars prefer to take the Southern Trunk Road from Trichinopoly, even though it is a bit circuitous. From Tanjore the southern districts can be reached directly through Pudukottah ; and there is no need to do it *via* Trichinopoly like the railway.



Roads and Railways of Tanjore District

The next important route is that of the east-to-west railway line from Tanjore to the port of Negapatam. This route may be looked upon as the eastern part of the Cauvery valley route from Erode to Negapatam which crosses the main north-to-south route with a common bit between Tanjore and Trichinopoly. From the point of view of the railway company, the former importance of this eastern extension has passed away with the shifting of the Railway Workshop from Negapatam to Golden Rock. The road running along this railway line is only of local importance, though the first part of it from Tanjore to Nidamangalam and thence to Mannargudi in the south has a busy traffic.

The District Board of Tanjore owns a good mileage of paying railway lines, which, in spite of the competition of motor transport, has not suffered loss to the same extent as, for example, the Tinnevelly District Board Railway. This is no doubt due to the higher density of population and the greater wealth of the deltaic region.

The main District Board Railway runs due south from Mayavaram through Tiruvalur on the Trichinopoly-Negapatam line to Tiruturaipundi crossing the numerous distributaries of the Cauvery. At the latter place, the line bifurcates, one line running south-eastwards to Vedaranniyam, a place of religious importance where thousands of pilgrims congregate on particular occasions for the sea-bath. The other line runs first south-westwards to Adiramapatnam, thence north-westwards to Pattukottai, and finally from there in a south-westerly direction to Aranthangi. This part of the railway, running as it does through a comparatively poorer region, does not seem to be as remunerative as the rest of the District Board Railways, after the advent of the bus transport.

The branch lines from Nidamangalam to Mannargudi, from Negapatam to Nagore, from Mayavaram to Tranquebar, and from Peralam to Karaikkal have, however, a better traffic, being situated within the deltaic region.

Tanjore, Kumbakonam and Mayavaram are three important nodal centres in the district, from which roads radiate in different directions with a busy traffic ; and this is due to the fact that they are all situated on the main S. I. Ry. line and on the Cauvery or on one of its main branches.

Before closing this part of the paper, it is interesting to trace the traditional track of the two pilgrim routes to Rameswaram southwards across the District, which are marked by the location

of the Rajah's *chatrams* or choultries. The endowments attached to these *chatrams* amount to such a large sum that there is a separate department of the District Board administering these charities, and maintaining educational and religious institutions out of their surplus funds.

Of the two *chatram* routes to Rameswaram across the District, the western one can be traced clearly from Tiruvadamarudur (Ammayichatram) up along the Cauvery through Darasuram (Rajarajapuram) and Nidar Chatram (near Tiruvadi), thence southwards through Vennar (near Tanjore), Sydambalpuram (4 miles south of Tanjore), Orathanad (Muttambalpuram), Pattukkottai (Kasankolam chatram) to Rajamadam near the coast, a little to the south-west of Adiramapatnam. From Rajamadam the route continues southwards, keeping close to the coast, passing through Sulakshnambalpuram (Ammanichatram) near the mouth of the Ambuliar, Manamelkudi (Draudambalpuram) a little to the south of the Vellar, where the coast-line projects into the sea on to Meemisal (Rajakumarambal chatram), which is otherwise known as the shrine of Tiruppanavasal. From there the route continues along the coast to Rameswaram, where lies the last Rajah's chatram called Sethukarai. It will easily be seen from the map that this pilgrim or *chatram route* to Rameswaram is a short-cut compared to the road and railway routes.

The easterly pilgrim route across the District can be traced from the shrine-town of Shiyali through Malliyam (near Mayavaram), Nidamangalam (Yamunambalpuram), Mahadevapatnam (near Mannargudi) and Kallianamahal (Ladu Bayi Ammal chatram). This route joins the main western route at Pattukkottai. The facilities afforded at the *chatrams* still keep up a steady stream of pilgrims, both pedestrians and those travelling by carts, in spite of the quick and cheap though round-about transport facilities afforded by the more modern means of conveyance.

It has been stated at the outset that the Tanjore District has a good mileage of roads, which compares favourably with that of most other districts. This can easily be accounted for by the dense population and greater wealth of the deltaic parts as well as by the almost level nature of the country, allowing of easy lay-out. But the condition of most of these roads leave a good deal to be desired ; though in the higher and drier south, outside the deltaic area, they are somewhat better.

The roads in Tanjore District are generally narrow, both in the urban and the rural parts except the car streets (Raja vidhis and Sannadhi vidhis) in the temple towns; they are usually very much cut up with pits and deep ruts, very dusty in summer and slushy in the rains. In all these respects, they stand as a contrast to those of the higher and drier districts like Coimbatore, Salem and Chittoor, where the bed-rock is near the surface which is not thickly over-laid with alluvium, and where good gritty metal is easily and plentifully available in the neighbourhood. The surface in the deltaic parts of the Tanjore District, on the other hand, is naturally built of river alluvium; and road metal has to be imported from the only available quarries in three centres: 1. near Vallam, in the neighbourhood of Tanjore; 2. near Aranthangi on the southern border; and 3. in the South Arcot District, brought in ferry-boats across the Coleroon. Limestone from out of the river-beds has been used to a small extent near Pattukkottai.

The narrowness of the roads is a legacy here from the pre-motor age as elsewhere; and there is a natural difficulty now in widening the roads to adapt them for modern conditions and requirements, as low-lying fields adjoin them mostly, and as the cost of acquisition of the productive paddy lands is prohibitively high. For the same reason, the avenues, especially where wet lands are adjacent to the roads, are mostly of cocoanut trees, and not spreading ones that can afford shade to the passers-by, as the same shade would be detrimental to the crops.

As Tanjore gets the heaviest rainfall of all the east coast districts of South India, the havoc done by the rains has also to be taken note of in accounting for the bad condition of the roads, though there is nothing here like the tremendous amount of erosion, which is in evidence in a West Coast district like Malabar.

Coming to water transport next, it has to be noted that in spite of the net-work of irrigation canals in this District, none of them is useful for the transport of either passengers or goods, unlike the Godavery or Krishna canal system, which from the beginning was designed to serve both for irrigation and for transport.

The Negapatam-Vedaranniyam canal, running for a distance of about 36 miles southwards from Negapatam to the southern end, was designed to bring the salt-pans of Vedaranniyam into touch with the railway terminus at Negapatam. The canal is still

used for this purpose as well as for carrying ordinary goods and passengers.

It is queer that with such an extensive sea-board for the district, the sea is but little used by passengers, though there is a good deal of sea-borne trade not only with other places outside the district but also to some extent between the several ports within the District.

The rivers were used, in former times before railways were constructed, for the transport of goods from Trichinopoly and other inland places. But this has now been given up, though there is still some navigation at the mouths of a few of the larger rivers such as the Koraiyar, the Adappar and the Tirumalaivasal Uppanar. The existence of shoals and the gradual decrease of the volume of water caused by irrigation have been the main causes of this disappearance of inland boat navigation. The rapidity of currents, which prevent the boats getting inland from the coast and the regulators which are unprovided with any locks unlike in the Godavery delta have further prevented the use of the rivers as waterways.

There are a large number of ferries across the several rivers in the District, which are managed by the District Board. They are required for use generally for 8 months in the year, and even for 10 months across the Coleroon. The ferry boats are usually round basket boats covered with leather, called *parisals* ; but long wooden boats are also in use in some places.

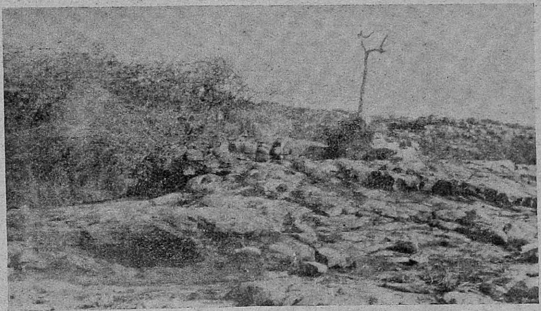
In conclusion, it may be stated that the communication-lines and transport methods in the Tanjore District show largely the influence of geographical factors such as location, surface, soil, rivers, rainfall, etc. as well as the impress of man's work.

Water-holes in the Owk Reserved Forest

By

Mr. Charles S. John, B.A.

In the north-western corner of Koilkuntla Taluk, in Kurnool District, there is a forest region called the Owk Reserved Forest, under departmental control. The top of it is a plateau with an altitude of 1,800 feet and descending in a gentle slope towards the east. The width of this forest region is about eight miles. The tract is rocky. The tree-growth is scattered here and there and in clusters in ravines. There is good pasturage in the loose earth amidst stones and this is the only grazing ground for cattle and sheep of all the adjacent villages and of the Sugali Thandas in the vicinity. The Sugalies penn their cattle in the reserve itself and the graziers live with the cattle, in the open, day and night. Carni-



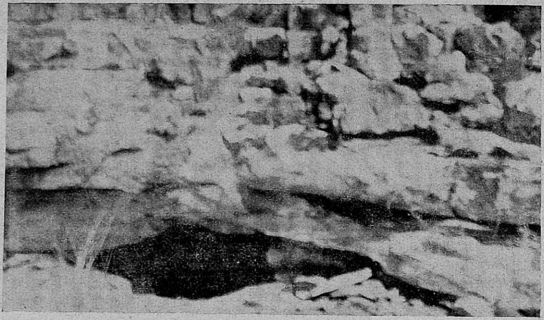
Chembu Dona

vorous animals have their homes in cool and shady nooks amidst big boulders and spring on straying cattle by day and prowl in the border villages by night, in search of dogs and untethered cattle. Wild boars, in myriads, lie in the ravines under the impenetrable tree-growth and stalk out in the night, into the cultivated fields

on the border, and gorge and devastate the crops in spite of the tin-drumming of the night-watcher on his '*mancha*.'

In summer months, after the Ugadi—the Telugu New Year's Day—pilgrims from far and near traverse this region to worship at the Kambagiri Swamy Shrine, on the eastern border of this Reserve.

In a vast stretch like this, frequented by man and beast, the essential of life—water—appears to be nowhere. As one walks across the plateau, his vision is surfeited with the fantastic shapes of huge rocks like nature's sentinels, and the deep ravines with



Ragiman Dona

tree-growth visible only when one walks up to the brim and looks down at the giddy depths. The wanderer is bound to get thirsty and his search for water will make him more thirsty with the exertion in this waterless region. The ravines which might contain some pools are inaccessible due to the impenetrable tree-growth which is mostly thorny. The village folk know where to look for water in this region. They warn a stranger to look out for a vertical dry twig amidst rocks, when he feels thirsty. That vertical dry twig indicates the spot of a hole in a rock filled with rain water. Such a hole in this locality is called a '*Dona*'—a water-hole in a

rock. There are several such *donas* on this plateau with different names, given by the village folk, according to the shape of the hole or any object near the hole.

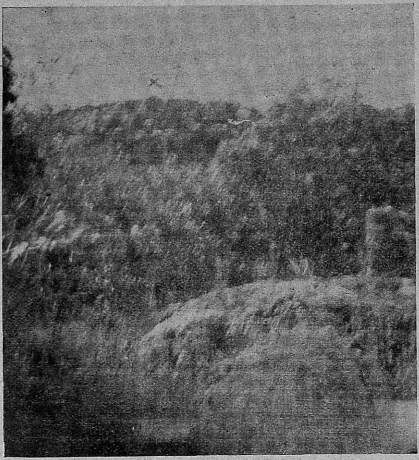
As illustrations, the water-hole in the picture I, with the vertical dry twig, is called '*Chembu Dona,*' for the hole is of the shape of a brass-vessel, narrow at the top and broad at the bottom, used

Boggu Dona

in Indian homes. In picture II, there is a water-hole at the foot of a rock, like a wall about six feet high, and a peepal tree stood near this hole. The tree fell in a storm but still the hole is called in Telugu after the peepal tree—'*Ragiman Dona.*' In picture III, the water-hole is called '*Boggu Dona.*' The water here looks dark like charcoal, on account of the black rock at the bottom of the water. In picture IV, the water-hole is called '*Gundu Dona.*' This dona is on a rock about fifty feet high and is named after the rock which is called in Telugu '*Gundu.*' There is a thin vertical twig on this rock, but it could not be focussed in the picture on account of the distance and height due to the vegetation around the rock.

These water-holes are generally from four to six feet deep and contain water throughout the summer. They accumulate rain water during the rains and thereafter the percolation through fissures in

rocks. The water is generally clear due to absence of leaf-droppings. These *donas* supply water to men and cattle by day and to wild beasts by night. The *donas* are very queer in shapes and it is a wonder how they were formed. It strikes one as if the



Gundu Dona

Almighty has preserved these little oases in this 'Rock Sahara' for the need of his Creatures; and Man by his ingenuity, with his finger —the symbol of the vertical dry twig,—planted at the spot—points to the thirsty pedestrian, the merciful provision of God in a rocky waterless region.

Geography and Education

TEMPERATURE AND RAINFALL FIGURES FOR AMBASAMUDRAM

(Collected at the Tirthapathi High School.)

Rainfall (inches) for 1932-36.

	1932.	1933.	1934.	1935.	1936.
January ..	0·04	0·62	8·27	3·90	0·20
February ..	1·82	1·75	0·00	0·20	4·35
March ..	1·17	0·61	2·31	1·25	6·16
April ..	1·68	5·97	1·23	2·97	0·00
May ..	5·85	3·10	1·20	0·00	6·13
June ..	0·20	1·55	1·35	0·84	3·44
July ..	0·08	1·82	0·22	0·51	1·05
August ..	4·38	2·40	0·02	0·33	0·13
September ..	0·02	0·61	0·00	1·18	3·85
October ..	5·78	5·73	12·48	7·96	5·62
November ..	9·83	10·36	2·16	7·03	16·86
December ..	5·54	1·02	2·68	8·02	9·12
	36·39	35·54	31·92	34·19	56·91

AMBASAMUDRAM

Average monthly Max. and Min. Temperature (° F.)—1932-1936.

Month.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	1932.		1933.		1934.		1935.		1936.	
Jan.	86·2	70·4	85·7	72·5	85·4	70·3	87·5	71·2	90·7	71·1
Feb.	91·4	71·7	92·5	70·9	92·5	69·1	92·7	70·6	94·7	73·8
Mar.	94·8	74·0	97·0	73·8	95·3	71·6	98·1	74·0	93·7	75·3
April.	99·0	78·0	96·9	77·4	101·2	76·2	98·7	76·9	99·8	78·1
May.	94·2	78·0	93·8	77·4	100·5	80·0	102·8	81·0	96·5	78·8
June.	95·1	78·9	92·5	77·8	93·5	77·7	96·9	78·6	93·5	75·7
July.	93·4	78·5	92·5	77·2	93·7	77·6	93·5	76·3	91·3	73·0
Aug.	94·5	76·5	93·5	75·6	95·7	77·8	94·8	75·6	95·2	75·0
Sept.	93·5	76·8	92·2	74·1	97·8	76·0	95·4	74·0	99·0	76·2
Oct.	90·8	75·7	92·7	71·4	91·7	74·4	90·3	72·0	95·2	74·1
Nov.	89·2	72·5	89·6	71·5	88·8	71·7	86·8	70·6	88·2	74·2
Dec.	86·0	71·8	88·7	71·1	87·2	71·2	86·5	72·2	87·6	71·4

SYLLABUS IN ANTHROPO-GEOGRAPHY

(Prepared for the Summer School of Geography, April, 1937.)

By

MISS MARY W. F. WADDINGTON, B.A. (HONS.), (BRISTOL)

I. *Introduction to Subject*: Geography, man and his environment, hence a study of man a necessity; Man as he was, is and will be. Methods of classification: Factors used, some modified by environment, others not: head form: face proportions; stature: hair: pigmentation: physiological basis, etc., bloodgroups. Can acquired characteristics be inherited?

General distribution of colour: present main groups: Mongoloids, Negroids, White and Brown or Caucasian races. No "pure" race to-day. Caucasian divisible into Nordics, Alpines, and Mediterranean peoples; even these much mixed. Man as he was: a primate: "development" controlled by his environment: gradually obtained dominance, especially last 200 years: now controls his environment, but cannot control himself or his creations: *i.e.*, differential rate of development, physically, mentally, and spiritually. Modern problems due to these facts: Germany, Italy, India. No isolation: inter-dependence of one country on another: thus importance of understanding man as well as his environment.

II. Man and his environment—gradual growth of man. "Primitive" man: Pre-Homo-Sapiens types: importance of Ice-Age: "Modern" man emerges—? Central Asia or Africa. Man destructive, hunter, collector; use of flints. Question of climatic changes: Relation of early types to present day primitive peoples. Beginnings of agriculture: Egypt, Mesopotamia, India. Life more complicated, movements of people. Change from Neolithic to Bronze Age and then Iron Age. Rise of so-called civilizations—Asia Minor Egypt, Greece and Crete, Rome. Later colonial expansions of European powers. Is the centre of population shifting?

III. Present day and future problems.—Complications in the present complex inter-action of man and his environment. His use of power: labour questions. Climatic control, problem of tropical production. Question of disease.

Colonial expansion of Europe and Pacific powers. Has man really out-run his control of environment? Question of development of new physical types.

Necessity of giving a well balanced view of the world as a whole: of their own part in the whole; of the part of their own nation. Many modern problems due to lack of understanding: only minor problems remedied by conferences, etc. Major problems still to be coped with. Need of a desire for mutual service based on understanding of interdependence of mankind.

REVISED SCHEME AND SYLLABUSES IN GEOGRAPHY FOR THE B.A. DEGREE EXAMINATION (GROUP vii)

UNIVERSITY OF MADRAS

(Approved in the Meeting of Academic Council held on 3-9-37).

The revised course in Group VIII—Geography for the B.A. Degree Examination shall comprise the study of (i) Regional Geography of India (in detail), (ii) General Regional Geography of the World, (iii) Physical Basis of Geography, (iv) Practical Geography and (v) and (vi) any two of the following subjects:—(a) Economic Geography, (b) Historical and Political Geography, (c) Anthropo-Geography, (d) Plant and Animal Geography (Bio-Geography).

The scheme of examination shall be as follows:—

	Hours.	Marks.
1. Regional Geography of India.	3	80
2. General Regional Geography of the World	3	80
3. Physical Basis of Geography	3	80
4. and 5. Two out of the following:—		
Economic Geography	3	80
Historical and Political Geography	3	80
Anthropo-Geography	3	80
Bio-Geography	3	80
6. Practical Geography	3	80
Practical Geography Note-books	..	20
Total	..	500

Physical Basis of Geography and Practical Geography will together form one division, and the remaining subjects another division.

SYLLABUS FOR REGIONAL GEOGRAPHY OF INDIA

A study of the setting or space relations of the country, its physical and structural evolution, including its soil and mineral resources; its climatic conditions and natural vegetation; leading to the division of the country into several distinct natural regions or environments, with corresponding different

human responses as shown by the population, its distribution, occupations, racial and social characteristics, etc.

A detailed consideration of each of the several natural regions distinguished above, with special reference to the nature of the physical and other factors involved, and of the human responses to them.

Relation between geographical regions and political divisions; Frontiers.

PHYSICAL BASIS OF GEOGRAPHY

1. **Climatology :—**

Temperature :—Insolation—Horizontal and vertical distribution of temperature.

Pressure :— Distribution and changes of pressure—wind systems—planetary, seasonal and local winds.

Precipitation and humidity :—Weather types, cyclones, anti-cyclones, etc.

Climate :—Classification of climates—climatic regions of the world.

2. **Geomorphology :—**

The earth—shape, size, origin, age, constitution, structure, materials of the crust, geological history. The evolution of land forms: forces at work, internal and external. Cycle of erosion under different climatic conditions. Influence of structure on land forms.

3. **Oceanography :—**

Distribution of land and sea; theories to explain this distribution. Oceans—their size—origin, submarine topography, temperature, salinity, etc. Movements of water: waves, tides, currents, drifts, etc. Deposits on the ocean floor. Life in the oceans—coral reefs, etc.

N.B.—**More advanced treatment than in the Intermediate Syllabus.**

ECONOMIC GEOGRAPHY

The same as the syllabus for Economic Geography prescribed for the Diploma Course in Geography with the following changes introduced therein: Under item 2. Agriculture **delete** the penultimate word 'and', and **add** at the end 'and tobacco'.

Under item 7. Industrial Development, after 'raw materials', **substitute the following** :—'The industries associated with sections 2 to 6, with special emphasis on the following :—cotton and jute, iron and steel and chemical industries.

(This change to be introduced in the Diploma syllabus also).

HISTORICAL AND POLITICAL GEOGRAPHY

1. **General :—**

Scope of Historical Geography—geographic determinism vs. possibilism.

The chief factors of environment, and their influence on Man; Location, physical features, climate and natural resources.

Man's adjustment to and control of environment: movement of peoples —growth of settlements and capitals—extent and expansion of tribal areas, kingdoms, empires and other states—frontiers—lines of communication. Introduction of plants and animals in new lands, improvement of breeds.

Stages of civilisation, and their relation to environment.

2. **Historical Geography :—**

(a) **India** :—The influence of physical factors on racial and linguistic distribution and on the course of History. Repeated invasions by land—empire-making and empire-breaking to the 18th century. Indian expansion to the East Indies and Indo-China. Sea contact with Europe from the 16th century onwards. Stages in the growth of the British power in India. The present political map of India.

(b) **The Far East** :—The influences of location and physical factors on the national characteristics of the Chinese and the Japanese and on the course of their history. Cultural and commercial connection of China with India from early times. European connection in the 19th century with China and Japan. Rise of Modern Japan and the Chinese Republic. Problems of the Pacific. Russia and the Trans-Siberian Railway. Sino-Japanese conflict—Manchukuo. Civil war in China. U.S.A. and Philipine independence. Britain and the Singapore base. Economic development of the Dutch East Indies.

(c) **The Moslem World : Central and South-Western Asia and Northern Africa** :—Influences of the deserts, the oases and the enclosed seas—highways by land and sea—movements of peoples from Central Asia—seats of old empires—rise and spread of Islam—the Mediaeval Arab Empire—the Turks—the break-up of the Turkish Empire—the new national states.

(d) **Classical and Christian Europe** :—Influence of peninsulas, enclosed seas, mountains and plains as well as of climate. Greek city-state and spread of Hellenism in the East. Growth and break-up of the Roman Empire. The map of Mediaeval Europe. Birth of nation-states. The decline of the Saracens and the rise of Turkey.

(e) **European Expansion** :—Age of discoveries—Spain, Portugual, Holland, France and Britain—trade and colonisation in the old and new worlds—Monroe doctrine. Discovery and colonisation of Australasia—partition of Africa.

(f) **The Nineteenth Century** :—Reactions of the Napoleanic wars, and the rise of Italy and Germany. Rise of Japan.

3. **Political Geography** —

(a) **Europe in 1914** :—The World War—the peace treaties and the post-war map of the world—League of Nations and the mandatory states—the rise of new small states.

(b) **The after-math of the Great War** :—New forces and new groupings of the powers: Fascism and communism. Modernisation in Turkey, Iraq and Persia. Egyptian independence. The Polish corridor—Italian ambitions in

the Mediterranean and Africa—Spanish Civil War—Britain in relation to Europe. The British Commonwealth in relation to World politics. Indian nationalism and the Indian federation—Indian nationals abroad. The World outlook.

ANTHROPO-GEOGRAPHY

Preliminary :—Scope and importance of this study—inter-action of man and his environment.

Factors used in the classification of Man :—Note avoidance of generalities as language, religion, etc. ; need for precise measurement. Problem of modification and inheritance. Cephalic index, head shape, facial proportions, nasal index, stature, hair, pigmentation, physiological (blood group) basis. Pigmentation in greater detail : eyes, hair and skin ; relation to climate, different theories ; question of mutation. Nature and texture of skin and flesh as affected by climate.

Racial distribution according to skin-colour—distribution of anthropological and other characteristics.

Origin and development of Man—primate—man-like apes, ape-like men —reconstruction of the primitive types of homo-sapiens—relation of geological and anthropological evidence in determining their ages. Development of brain.

Importance of the Ice Age as the dividing line between pre-historic and modern man. Changes during and after the Ice-Age. Diffusion of modern types.

Palaeolithic and neolithic ages : general account of their extent and culture. Growth of domestic life, agriculture etc.—trade—copper—search for tin—bronze age. Development of 'civilisation'—leading to study of earlier centres, Mesopotamia, India, Egypt, and later ones, Crete, Greece. Control of these centres by geographical factors—e.g., climate, routes, harbours, minerals, etc. Similar control apparent in more extensive and intensive civilization in Iron Age—Asia Minor, etc. Development of Asiatic (e.g., China) and European culture and civilization centres.

Study of the natural spread of peoples and trade movements—routes eastward and westward, northward and southward—gradual population of the world. Unsolved problems, e.g., Maya civilization—Incas—Cambodia, etc. Main groups of peoples at present time : Negroids and Negritos.

Australoids. Their origin, distribution, cultures. Types—e.g., Upper Congo Pygmies, Semangs, Bushmen, Tasmanians, Maoris, Melanesians, etc. Possible relation to Palaeolithic types of some of these.

Mongoloids—e.g., Mongolians, North American Indians, Eskimos.

Caucasians—e.g., Nordics, Alpines, Mediterranean, Associated types, e.g., Armenoid. The "Brown Race" problem. The study of types, e.g., Bedouins, Scandinavian, Pathans, etc.

Population of India—racial, linguistic and cultural groups. Cycles of culture and immigration. Links with the west and the Far East. Necessity

for further intensive study as in Western Europe. Composition of present population.

Present problems and the future—development of the study of genetics—application to population problems.

BIO-GEOGRAPHY

1. **General** :—Biology and Bio-geography—multiplication of numbers and natural expansion—struggle for existence ; modes of association—limitations of the environment and adaptations to it, e.g.. evolution, migration, isolation.

2. **Plant Geography** :—The environment of plant life—the influence of climatic and soil factors, and the modes of adaptation—the habitat ; plant and animal neighbours—plant communities, and successional types—dispersal and migrations of plants.

The great plant formations of woodland, grassland and desert and their chief divisions—their characteristics and distribution—their relations to their environments.

Cultivated plants, their distribution—forests ; their relation to climate, soil and water-supply ; their economic value.

3. **Animal Geography** :—The influence of the environment upon the development, habits and migrations of animals.

The zoo-geographical regions ; their characteristics and extent ; their relations to past and present physical conditions ; the geographical units within the zoo-geographical regions ; their faunas and their adaptations to the geographical conditions.

Aquatic life—relations to the conditions of the water, and to food supply —the divisions of aquatic life ; their characteristics.

Domestic animals: their distribution and characteristics—sea-fisheries, their physical and biological conditions.

PRACTICAL GEOGRAPHY

A. **Study and interpretation of** :—(1) Topographic maps of India on scales 1″ : 1 mile ; ½″ : 1 mile ; ¼″ : 1 mile. (2) India and adjacent countries on the scale of 1/M. (3) Standard topographic maps of some of the chief countries of the world—(Great Britain, France, Germany, U.S.A., Switzerland, etc.). (4) International maps. (5) Weather maps. (6) Simple geological maps.

B. **Methods of representing** climatic, economic and other geographic data **by maps and diagrams.**

C. **Simple methods of survey**—Chain, prismatic compass, plane-table, clinometer, level and theodolite.

D. **Methods of determining Latitude and Longitude—Time.**

E. A study of the principles and geometric methods of construction of the following map projections :—

(1) **Conical Projections** :—Equi-distant with one standard parallel, with two standard parallels, Bonne's equal area with two standard parallels, and orthomorphic, polyconic and international.

(2) **Cylindrical Projections** :—Equi-distant, equal area and orthomorphic.

(3) **Azimuthal Projections** :—Equi-distant, equal area and orthomorphic, Cassini's and Lambert's.

(4) **All World Projections** :—Sinusoidal, Mollweide, Orthographic, Aitoff's, etc.

(5) **Choice of Projections.**

N.B.—**Practical work note-books to be submitted by the candidates.**

TEXT-BOOKS.

Books for Study :—

P. Lake : Physical Geography, (Cambridge University Press).
A. Wilmore : Groundwork of Geography, (G. Bell & Sons).
Prisson and Schukert : Introductory Geology—Volume I.
Kendrew : Climate (Oxford University Press).
Austin Miller : Climatology, (Methuen).
Murray : Ocean.
Mathematical Geography : Jameson and Ormsby—Volume I, (Pitman).
Alice Garnett : Geographical Interpretation of Topographical Maps, (Harrap).
C. G. Carter : Land Forms and Life, (Christophers).
Hardy : Geography of Plants, (Oxford University Press).
Newbigin : Animal Geography.
C. K. Elton : Animal Ecology.
Chisholm and Stamp : Handbook of Commercial Geography, (Longmans).
Lyde and Shackleton : Atlas of Economic Geography, (Bartholomew).
Oxford Advanced Atlas : Bartholomew, (Oxford University Press).
Bowman : New World, (Harrap).
C. B. Fawcett : Political Geography of the British Empire, (University of London Press)
Unstead : New Regional Geography, (Longmans).

Books for Reference :—

Imperial Gazetteer of India, Volumes 1 to 4 and 26.
Lyde : The Continent of Asia, (Macmillan).
L. D. Stamp : Asia—A Regional and Economic Geography, (Methuen).
Kendrew : Climates of the Continents, (Oxford University Press).
A. F. W. Schimper : Plant Geography upon a Physical Basis, (Clarendon Press).
Febvre : A Geographical Introduction to History. (Kegan Paul).
Brunhes : Human Geography, (Harrap).
Vidal De La Blache : Principles of Human Geography, (Constable).
Semple : Influence of Geographical Environment,

Salisbury : Physical Geography.
Ll. R. Jones : North America, (Methuen).
Shanahan : South America, (Methuen).
Griffith Taylor : Australia, (Oxford University Press).
L. W. Lyde : Continent of Europe, (Macmillan).
Shackleton : Europe, (University of London Press).
Fitzgerald : Africa, (Methuen).
Haddon : Races of Man.
Duddley Buxton : The Peoples of Asia.
Daryll Forde : Habitat, Economy and Society.
Griffith Taylor : Environment and Race.

Correspondence

LETTER FROM MR. L. C. W. BONACINA

LONDON,
11th August, 1937.

Dear Sir,

On page 25 of your Journal for April 1937 there occurs the startling statement that the mean annual temperature of London is 66·4° F. That figure is subtropical and 3 or 4 degrees above the mean of the warmest month in London, normally July. Actually the mean annual temperature is 49·8° F. (Greenwich long—period) which is more sub-arctic than sub-tropical. I trust Huntington does not make this error; if he does I should like to know the chapter and verse. In any case, perhaps, you would insert a correction in a future issue of your Journal.

The stupendous difference of climate between England and India is shown by the fact that the mean temperature of January in Calcutta is decidedly above that of July in London. Although the length of the day and altitude of the sun at noon is greater in the English summer.

Yours truly,
L. C. W. BONACINA.

[The author of the article regrets that the words "**mean annual** temperature of London" on page 25 referred to is a slip for "**mean** summer temperature of London." In support of his main arguments, he gives the following references—EDITOR.]

References to Huntington's "Ideal Climate." In "Human Habitat" p. 141 he gives the ideal climate as having 65° F. in summer and 40° F. in winter.

In "Edonomic and Social Geography", Huntington and Valkenburg, p. 112 he gives 60-68° F. in summer and 36-44° F. in winter as ideal.

In "Civilisation and Climate", p. 220 he gives the ideal climate as having annual average as 51° F. Summer 64° and winter 38° F.

Note.—London has an average temperature of 38° in January and 63° in July.—S. Muthukrishnan.

Extracts from Periodicals

SINGAPORE AND THE KRA CANAL

Ernest O. Hauser writes in *Foreign Policy Reports* (issued on May 15, 1937) on "Anglo-Japanese Rivalry in Southeast Asia":

The growing importance of Singapore as an air base and vital link for commercial air lines adds to its state of preparedness for modern warfare. Singapore's "monopoly", based on Geographic facts, has been skilfully used by Britain.

The chief danger which threatens is the disappearance of this monopoly. The opening of a second sea connection between the Indian and Pacific oceans would shake the entire position of the British Empire in the East; and questions regarding the possibility of such a connection have been periodically asked in the House of Commons. Britain has been particularly disturbed by rumours hinting at an agreement between Siam and Japan to cut a shipping canal across the narrow isthmus of Kra on the northern end of the Malay Peninsula. This isthmus, which is the divide between the Indian and Pacific oceans and represents the "neck" of Singapore, is only 25 miles wide at its narrowest point. The water level on both sides of the isthmus is the same, and the soft alluvial soil would present no particular technical or financial difficulties. The isthmus-politically speaking-is part of the kingdom of Siam, the only independent native state in South-eastern Asia.

STUDY OF GEOGRAPHY IN INDIAN SCHOOLS AND COLLEGES

By

Mr. K. V. W. Dharan, B.Sc., (*Lond.*), F.R.G.S.,
Department of Education in Travancore

Indians have distinguished themselves in almost all branches of learning, but India has yet to produce a geographer with even a national reputation. Neither is there amongst us a traveller of distinction, nor in our literature, ancient as well as modern, an informed book of travel. This by no means indicates that we are a hermit nation. Indians have penetrated to every corner of the

earth, and some of them have even played, as in Tibet, a conspicuous and courageous role in the history of modern explorations. Nevertheless, our heritage and present extent of geographical knowledge remains meagre, while even countries such as Egypt, Iraq and China—leaving alone those of Europe and America—have marched ahead of us in the general recognition of the importance of the subject to national life and in the encouragement given to its propagation by educational authorities and central organisations.

There is a general belief in Indian academic circles that, though we have lagged behind, the subject is slowly coming into its own—a belief which is, however, unwarranted by facts. In the report made, on the opening of the Summer School of Geography, by the Secretary of the Madras Geographical Association, it was stated that at one time there were as many as six colleges in Madras with intermediate courses in Geography, but at present there are only two women's colleges teaching the subject. This makes it evident that, at least in Madras, geography teaching in colleges, far from progressing, has in reality retrograded within recent years.

The reasons for the sudden crop of geography departments followed by an equally abrupt blight, would form an interesting subject for investigation ; but the main cause for their discontinuance must have been the lack of geography students. No college, however stable financially, can afford to run empty departments. Why these departments should have remained empty, while similar departments in other parts of the world were working to capacity, can, I think, be answered by examining the present position of geography teaching in the high schools of India.

HOW THE SUBJECT IS STUDIED

The position is anomalous. The most glaring anomaly is that it is the only subject which is taught in the Indian High School by men who have never studied it in a university. Efforts have recently been made to rectify this drawback by instituting a diploma course at the University and by including it as a subject for the L.T. Course. But, unfortunately, as pointed out by the Secretary of the Madras Geographical Association, "The teachers in South India have not begun to appreciate the value of the (diploma) course," while a "twice-trained B.Ed.", writing to the Editor on 2nd May, has complained, among other things, that in many of the high schools, even those who were trained to teach the subject, were

not given preference to handle it. It is, therefore, no exaggeration to state that on the main the subject continues to be taught by men, whose entire geographical knowledge consists of what they have gleaned from a variety of school text-books. For all we know, they may be excellent teachers, but the limitations from which they suffer, in some respects in common with the diploma-holders and geography L.T.'s. are obvious.

First of all, though it has now become the rule to teach science subjects in laboratories, such a practice has yet to be established in the case of geography. It is rarely that we find in a high school a geography room ; even where one is available, it is never equipped on modern lines. At the most, it may contain a few wall maps, a globe and perhaps a tellurion ; but no one ever thinks of providing it with an epidiascope, or even with a magic lantern, nor of putting up in a corner of the school compound a set of meteorological instruments. The poverty of a geography room can easily be gauged by inquiring at a school for a one-inch survey map of the surrounding district, indispensable to the realistic study of modern geography. In the majority of schools, it will not be possible to find one, while there may be a good many geography teachers, who may not have even seen such a map. Perhaps they are not to be blamed quite so much as the present S. S. L. C. Geography Curriculum, which bids fair to achieve some measures of immortality as the one curriculum that does not contain even a cursory reference to a map. In short, the present-day geography teacher is denied all those aids and appliances which help to make his subject so fascinating to the students. He is still in the unfortunate position of the science teachers of old, who had to ask their students to imagine the experiments which, owing to lack of appliances, they could not carry out, and who usually rounded off their lessons by telling the class to take it for granted that the experiments had already been performed.

WANT OF GOOD LITERATURE

The difficulties of the geography teacher would have been considerably mitigated, had he access to a good library. In the few schools and public libraries that the writer has examined, he found the geography sections filled with books, which were hopelessly out of date. This is only natural, for the writer on geography is in the position, as a well-known geographer has said, of a girl pillion rider, who, in the course of a ride, exclaims to her pilot, " This is a pretty village, *wasn't it ?* " Geography books have a tendency to go out of date as soon as they are published, and no school can be expected to keep the latest editions, so that what geographical knowledge

that reaches the high school student, by the time it reaches him, is doubly stale and unprofitable.

In this connection one may note another characteristic of geography books. Though there is a plethora of school text-books, in the majority of cases old books rehashed and served up between new covers, standard works on the subject are comparatively few, though there exists a vast amount of material in the form of articles, which have appeared in a large number of geographical periodicals. Within recent years an effort has been made to consolidate these articles into books, which could be used by University students, but even now there exist many gaps, as, for example, the absence of a standard work on India or China. Even undergraduates have to have constant recourse to periodicals, such as the Geographical Review, Geographical Journal, Economic Geography, the Scottish Geographical Magazine, Geography, La Geographie, Annales de Geographie, Petermanns Mitteilungen, Zeitschrift der Gesselschaft fur Erdekunde of Berlin and various other bulletins and monographs, issued by well-known geographical societies, none of which is available to the Indian teacher who desires to attain a knowledge of the subject above high school standard.

GERMAN AND FRENCH CONTRIBUTION

One may also note here that we owe it mainly to the late Vidal de la Blache, a Frenchman, for having saved modern geography from being absorbed by geology and sociology and for redefining and rehabilitating the science. Under him has risen a galaxy of French Geographers, who have been unequalled in scientific knowledge, cultural attainments and in literary expression, and whose works must be consulted by those who desire to develop a truly geographical view-point. Further, the fore-runners of Vidal de la Blache, such as Carl Ritter and Alexander Von Humboldt, were Germans ; so are the greatest living exponents of climatic regions and vegetation regions, Professors Koppen and Passarge respectively. If it is true that in the study of any science, a knowledge of French and German becomes sooner or later a matter of necessity, it is much more so with regard to modern geography, for some of the most important works in the two languages have yet to be translated into English.

Finally, one of the greatest difficulties that a geography teacher has to contend against is the indifference shown towards the subject not only by the Indian public but also by educational authorities, owing mainly to their ignorance of its complexity and significance.

Unlike in almost all civilised countries, there does not exist in India a central organisation for the diffusion and promotion of geographical knowledge by educating public opinion and by giving encouragement to its members to carry out geographical work of an original nature. This is a striking fact, especially when we remember that hardly a year passes without a paper being read to the Royal Geographical Society of Great Britain by one of its members on some aspect of India. It is not generally realised in this country, that some of the most active members of the above society are men, who take a dominant part in the defence and administration of the Empire, men, who have recognised the vital part that geography plays in the survival of a nation.

Thus we see the extent to which Indian teachers are hindered from acquiring a liberal knowledge of the subject. Not only do they lack the necessary discipline and training in geography, but they lack laboratories, books, periodicals, not to speak of their ignorance of languages and of the absence of an active geographical organisation. It is no wonder, therefore, that students leave the high schools, not so much with an enthusiasm for the subject as with an aversion for it. So long as this happens, geography departments in colleges will remain empty, and so long as the departments remain empty, the present plight of geography teachers would continue. The vicious circle into which the subject in India has fallen is thus complete.

There is one method by which this circle can be broken, but it is so expensive that it can only be tried if we fully realise how important the study of geography is to a country which has vested interests abroad and which aspires to be independent. It is to set up in every college a fully equipped department, with a qualified staff, which would content itself at first with carrying out research work, such as village surveys, with giving extension lectures and holding refresher courses. It would work in close co-operation with the geography teachers of the area, who should have free access to the books, periodicals, maps and appliances of the department. If this is done, in course of time we may expect to find students drifting into the department, who going out would set up, we may hope, a new cycle of enthusiastic geography teachers and equally enthusiastic geography students.

The Hindu.

News and Notes

It is regretted that the publication of this issue, and consequently of the next one for December 1937, has been delayed owing to unavoidable reasons. The December number will close a series; and from January 1937, when the calendar year will be adopted as the Association and Journal year, a new series will begin with the new title of Journal of Geography. The numbers of this new series will be issued in January, April, July and October of each year. Several new features will be introduced to make the Journal more useful and more attractive.

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In a contribution to *The Hindu* a few weeks ago on *the Study of Geography in Indian Schools and Colleges,* (extracts from which are published in this issue), Mr. K. V. W. Dharan of the Travancore Educational Service deplores the absence of " a central organisation in India for the promotion and diffusion of geographical knowledge by educating public opinion and by giving encouragement to its members to carry out geographical work of an original nature ". To a considerable extent the Madras Geographical Association has been functioning in the manner suggested above, though within the limited sphere of South India alone. The need for an All-India Association for Geography Teachers like the British Geographical Association has been generally felt and expressed in several quarters ; and the question was informally discussed last Christmas at Hyderabad at the time of the 24th Session of the Indian Science Congress. It is expected that further discussions will take place at Calcutta during coming Christmas and New Year at the time of the Conference of the All-India Federation of Teachers' Associations and of the 25th Session of the Indian Science Congress, which will result in the creation of a body which will fill a gap and help the cause of geography. The Madras Geographical Association, which has done much pioneering work in this direction for the last twelve years will no doubt have opportunities for further service in a larger sphere and in a fuller measure.

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Several of the papers contributed for the Tanjore Geographical Conference during May last, which had to be held over from publication in the previous number for want of space, have now been included in this issue of the Journal, which so far as the Tanjore papers are concerned may be looked upon as a supplement to it. It may be stated in this connection that the paper on

"*Negapatam: A Sea-port Town of South India*" by S. R. Pandyan published in Volume XI, No. 4 of the Journal for January 1937 and the article on *the Mettur Canal System* published in Volume IX, No. 2 of the Journal for July 1934 may be taken together with this and the previous issue as a fairly full contribution to the geography of this important deltaic district.

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A meeting of the Association was held on the 28th August 1937 at the Presidency College under the Chairmanship of Miss Mary W. F. Waddington, when Mr. S. Muthukrishna Das, B.A., Hons. (London), delivered a lecture on "*Modern Conurbations,*" which was followed by a lively discussion.

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Another meeting was held for the quarter in the same place on 8th September 1937, when Mr. F. J. H. Grattan, B.Com., Dip. in Anthr. (Cantab.), an Officer of the New Zealand Mandate Service of Western Samoa, narrated his thrilling experiences of a Motor Journey which he had just completed from London to Bombay in a Morris Eight, illustrating it with views.

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A course of Practical Training in Surveying and Plan-Drawing was conducted in Trichinopoly, early in October last, for the benefit of Secondary and Elementary School Teachers, by Mr. S. Anantanarayanan, Principal of Civil Engineering, Trichinopoly, and one of the enthusiastic Life Members of the Association. The National College compound inclusive of all buildings was surveyed and planned; and the training was much appreciated by the teachers. It is proposed to follow it up by a supplementary course on "Contouring" as applied to Geography.

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Rainfall Statistics are available for several places in each district from the meteorological supplement to the Fort St. George Gazette, possibly because of their bearing on Agriculture and consequently on revenue; but, similar figures are not available for temperature except for a limited number of stations in South India. This stands as a severe handicap in carrying out any intensive research work. It was, therefore, suggested in this Journal some years ago that the several high schools in the Presidency which are all equipped with simple meteorological instruments, at least for the Science Laboratory if not for the Geography Department, can arrange to collect records of weather data for their respective localities, and either exchange them or send them for publication in the Journal, so that the figures may be available for all that may need them. We are glad that at least one institution acted on our

suggestion. Mr. T. S. Sundaram Ayyar, the veteran teacher of Geography in the Tirthapathi High School, Ambasamudram, who has just retired from service, has collected figures of miximum and minimum temperature and of rainfall for Ambasamudram for a period of five years (1932-36), which have been published in this number. It is hoped that his successor will keep up the work, and other teachers of Geography will similarly try to supplement the work of the meteorological department.

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Members of the Association are informed again that the next Annual Geographical Conference will be held at Mangalore. Mr. M. N. Kamath, Geography Assistant of the Kanara High School, has been elected Provisional Secretary to make the local arrangements in connection with the Conference. Contributions of original papers are invited from members and others on various aspects of the Geography of South Kanara District.

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The Syllabus in Geography for the B.A., Degree Examination of the Madras University has recently been overhauled; and in order that members of the Association may have an idea of the scope and standard of the subject in the Degree course, the entire revised syllabus has been published in this issue.

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We are glad to note that Mr. S. Muthukrishna Das, an old member of the Association, who has recently returned from England taking an Honours Degree in Geography of the London University, has been taken as a Research Student in Geography in the Madras University. He is working on *the Historical Geography of South India*, a subject which has not been touched by anybody hitherto, and as such offers plenty of scope for original work.

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Among the scientists who are expected to attend the Silver Jubilee Session of the Indian Science Congress as delegates of the British Association are the following Geographers:—Prof. H. J. Fleure of Manchester University, Prof. C. B. Fawcett of University College, London, Prof. A. G. Ogilvie of Edinburgh University, Prof. J. McFarlane of Aberdeen University, Dr. L. D. Stamp, Cassel Reader in Economic Geography, London University, Dr. O. J. R. Howarth, Secretary of the British Association, and Prof. R. H. Kinvig of Birmingham University. It is hoped that under the inspiration of these distinguished scholars, there will be a public opinion created in the country in favour of Geography; so that the subject will find its proper place in all the Indian Universities.

The Annual Meeting of the British Association for the Advancement of Science assembled at Nottingham during the first week of September 1937. Prof. C. B. Fawcett, who presided over Section E. (Geography) delivered his Address on "*the Changing Distribution of Population*" (extracts from which will be published in the next issue of the Journal). Most of the papers read pertain naturally to British topics ; and there was an interesting discussion on "*Natural and Cultural Regions*". On one of the evenings, a series of brief talks were given by representatives of different Sections on "*Planning the Land of Britain*", in which "the contribution of the Geographer through the agency of Dr. L. D. Stamp, compared favourably with that of other Sections. Dr. Stamp emphasized the desirability of replacing the mediaeval ideal of parochial self-sufficiency by something approaching more nearly to the national self-sufficiency now for the first time made possible by improvements in communication. The "reconditioning" of the land as suggested by the Land Utilisation Survey would appear approximately to double the potential productive capacity of the country in foodstuffs alone". The Session closed with a paper by Miss Alice Garnett, on *Sunshine as a Factor in the Human Geography of Alpine Valleys*".

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The International Geographical Congress of 1938 will be held in Amsterdam from July 18th to 28th. Membership in the Congress is open to Geographers, members of geographical associations, and persons professionally connected with institutions and organizations whose field of work bears on Geography. The programme of the Congress includes the presentation and discussion of the reports of the special commissions nominated at the 1934 Warsaw meeting, of papers by members on a restricted list of topics, and geographical excursions.

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The Second International Congress of Anthropology and Ethnology is to be held at Copenhagen from August 1st to 6th 1938, thus permitting delegates to the International Congress of Geography at Amsterdam to attend both meetings in succession. Under the Presidency of M. Thomas Thomsen the Congress will deal with researches on the scientific study of Man under the following heads : Physical Anthropology, Psychology, Demography, Ethnology, Ethnography, Sociology and Religion, and Languages. Morning conferences will include specialised papers ; afternoon sittings deal with subjects of more general interest ; and joint meetings between sub-sections take place after five o'clock.

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Reviews

A Geographical Analysis of the Lower Indus Basin (Sind). By Maneck B. Pithawala, Professor of Geology, N. E. D. Engineering College, Karachi. 1936. Price Rs. 5.

This pioneer work on Sind was commenced by the author as a thesis for post-graduate research at the University of London under the guidance of Prof. E. G. R. Taylor and Dr. A. M. Mathews. It throws light on many aspects of the geography of the Province and is full of scientific and literary material collected by him, no doubt, at considerable time and trouble, and possibly personal expense also.

In the Introductory Chapter the author first describes broadly the fundamental geographical features of India as a whole that have influenced the history and present condition of the country, and then discusses the outstanding geographical features of the Indus Basin in general and of Sind in particular.

After dealing with the Physiography of the Lower Indus Basin as a whole in Chapter I, Mr. Pithawala discusses in detail the special characteristics of each of the three sub-regions into which he divides the Province. He then rounds it off in a final section with a consideration of the economic resources of each of them.

In Chapter II the Indus River is the theme of study, with a full discussion of its geological and human history, regimen and physical characteristics, supported by a wealth of facts and figures. The volume is well illustrated with numerous maps, charts, graphs, sections, etc., thereby adding to the accuracy and vividness of the picture and the arguments.

We have much pleasure in welcoming this first systematic attempt at a full geographical analysis of a region in India. It is hoped that the publication of this book will induce others qualified to do so to analyse and work the detailed geography of their Home Regions in a similar scientific way.

Historical Geography of Sind. By Maneck B. Pithawala, Professor of Geology, N. E. D. Engineering College, Karachi. 1936.

This book is a companion volume to the author's other book reviewed above, and deals with the pre-historic and early historical

periods of the Historical Geography of Sind in the centuries before the Christian Era. After dealing with the Aborigines in Section I, the author gives an interesting account in Section II of the human geography of the Indus Culture people, including a brief suggestive account of their contact and conflict with the Aryans of the Upper Indus Valley. In the later sections the Persian and Greek conquests and connections are dealt with, after which the volume concludes with a brief summary of the geographical value of the Sind region through the ages.

Gaps are inevitable in a work of this kind, dealing with long periods of early history, much of which has to be conjectural ; but it is somewhat refreshing to find the geographic perspective kept in view in this historical argument, which is unfortunately rarely the case in this country. We hope the author will follow up the historical geography of his Province through later historical times.

Food, Clothing and Shelter: Book II. By L. McD. Robinson. (Macmillan & Co., Ltd.). 1937. Price annas 10.

The first book of this series was reviewed in the previous number of the Journal. This series is written from the point of view of teachers and pupils living in the tropics, with little or no experience of varying lengths of daylight during the year, of the intense cold and stoppage of plant life during winter and of any industrial process. Though Ceylon has been used as the home of the pupils, any other part of the tropics may serve as well, as the variations in seasons are expressed more in differences of rainfall than of temperature and where the same foodstuffs, clothing and shelter are commonly found.

Another novel feature about the books in the series is the division of each lesson into two parts, combining teaching and learning. Facts given under Part A for pupils to acquire as Geographical Knowledge are tested in Part B in the shape of exercises which serve to fix the knowledge acquired earlier. The book aims at giving some geographical training to pupils in primary classes for later application to problems of ordinary life.

In this second book, the earlier lessons deal with the need for and significance of the map, the idea of polar lands having great differences in the length of day and night, etc. As in the first book, world geography is treated in the remaining chapters from the human point of view, based on the occupations of the chief pro-

ducers of food, clothing and shelter in the different natural regions of the world.

Big bold type and numerous choice pictures, maps and diagrams make the book attractive and useful to children. It can be used with advantage in South Indian Schools, if it is translated into Tamil and other local vernaculars.

Food, Clothing and Shelter : Teachers' Books I and II. By L. McD. Robinson. (Macmillan & Co., Ltd.). 1937. Price annas 8 each.

This series of books has been primarily prepared to help teachers whose pupils use " The Food, Clothing and Shelter " Series of Geographical text-books reviewed above. In the later chapters of each of the books the teacher is given hints for each lesson on 1. points to be emphasized by him, 2. aids for teaching, 3. B. B. summary and B. B. statements and 4. tests, and for some lessons 5. Local knowledge that may be expected of the pupils and 6. knowledge of which the pupils have no local experience.

But the first six chapters of each volume, covering nearly half the book, contains general discussions on the teaching of Geography, which will be found helpful for any teacher of Geography. They deal with the Aim of Geography, the Syllabus of Geography, the Chart of Geography, the Method of Study, the Learning and Teaching of Geography and the Aids to the Teaching of Geography. The treatment of these topics is clear and simple ; and from these chapters the elementary school teacher can get real help in handling Geography.

Longmans' Descriptive Geography : Books I, II and III. By L. D. Stamp. (Longmans, Green & Co., Ltd.). 1937. Price 12 as., 14 as., & 14 as.

These three books form a series intended for use by junior pupils in secondary schools, and covers the ground for a three years' course in accordance with the syllabus issued recently by the Madras Educational Department. The treatment is descriptive and regional, and aims at bringing out the influence of geographical environment upon human activities. The books are written in simple English ; and they may be used in schools where English is the medium of instruction. The volumes are copiously illustrated

with pictures, maps and diagrams ; and is printed in bold type with an attractive get-up.

Man and His Life : *Books I, II and III.* (Tamil). By Mr. M. R. Subramaniam. (S. R. Subramania Pillai, Tinnevelly). Price 10 as., 12 as., and 12 as.

This series of three books is based upon the Departmental Syllabus recently prepared for the middle school forms. The treatment is regional and descriptive ; and the relation between human activities and environment have been well emphasized. The books are well illustrated by a fairly large number of selected pictures, though the maps are not quite clear or attractive enough for youngsters. They are written in simple and chaste Tamil ; and the get-up is neat and attractive.

A Regional Geography of the World for High Schools. By N. Subrahmanyam. (The Indian Publishing House, Ltd., Madras). 1937. Price Re. 1-12.

This book, which closely resembles the latest revised Departmental Syllabus in Geography for Forms IV, V and VI presents in one volume the author's *Regional Geography of the World for High School* and *A Geography of India.* The syllabus on India, which is followed in this book, is the revised one of 1934, in which the country is treated regionally with local and world correlations. In spite of its size and the large number of useful maps, pictures and diagrams, the Publishers have managed to keep down the price within modest limits.

An Introduction to Indian Economics : *Part I.* By Rabindranath Chaterje. (Indian Publishing Company, Calcutta). 1937. Re. 1, as. 12.

We have marched far from the days when Economics was studied as purely an abstract science without much reference to actual conditions ; and the study of descriptive economics on a national basis has become common in Universities in this country and abroad.

This volume under review presents the first part of Indian Economics (Production) in a simple and non-technical way that both laymen and University students can use it profitably. Several

chapters in the book such as those dealing with Economic Geography, Economic Resources, Problem of Population, Agriculture and Industries can be read with advantage by students of Economic Geography as well as by students of Economics. The volume is valuable as a general introduction to the subject.

The Oxford Economic Atlas. By John Bartholomew with an Introduction by L. W. Lyde. (Oxford University Press). 1937.

This is the eighth edition of the popular and useful atlas by the well-known cartographer, John Bartholomew. The maps in the atlas fall into three large groups. The first group consists of about 16 world maps showing physical, climate and economic and other human features. In the second group may be included systematic maps of the several continents, showing physical and human features. The last group contains maps of the world, showing the distribution of the important commercial products with rectangular diagrams in each, giving their relative production in the several producing countries. The first plate contains a series of diagrams, showing the commercial growth of the several nations from 1800 to 1934. The valuable introduction by L. W. Lyde makes the volume almost a good text-book, in addition to being an atlas, which may be used with advantage by the University students as well as by teachers of Geography.

Books and Journals Received

Food, Clothing and Shelter : Book III. By Mc D. Robinson.
" " " : Teachers' Book : Books 1 and 2. By Mc D. Robinson.
A Geographical Analysis of the Lower Indus Basin (Sindh) : (Part I). By M. B. Pithawala.
Historical Geography of Sindh. By M. B. Pithawala.
Longmans' Descriptive Geography : Books 1, 2 and 3 (*English*). By L. D. Stamp.
An Introduction to Indian Economics. By R. Chaterje.
A Regional Geography of the World for High Schools. By N. Subrahmanyam.
The Oxford Economic Atlas. By J. Bartholomew and L. W. Lyde.
The Geographical Magazine : August, September and October 1937.
The Geographical Journal : August, September and October 1937.
The Indian Educator : August and September 1937.
Educational India : August, September and October 1937.
Kalaimagal : August, September and October 1937.
The Hungarian Geographical Review : LXV-Koet, 1-3 Szam, 1937.
International Review of the Hungarian Geographical Society, 1937 : Vol. LXV, Nos. 1 to 5.
The Educational Review : August, September and October 1937.
Bibliography of the Orient (U.S.S.R.) : No. 10 (1936).
Brahmavidya : *The Adyar Library Bulletin* : October 1937.
The South Indian Teacher : September and October 1937.
Geography : September 1937.
Mitteilungen Der Gesselchaft fur Erdkunde Zu Leipzig : 1934-36.
The Scottish Geographical Magazine : September 1937.
Geographical Review : October 1937.
Journal of the Manchester Geographical Society : 1936-37.
Journal of Indian History : August 1937.
Indian Journal of Economics : October 1937.
Quarterly Journal of the Mythic Society : October 1937.
Journal of Annamalai University : October 1937.
Indian Co-operative Review : July-September 1937.

Select Contents from Recent Geographical Journals

The Geographical Journal: June 1937.

The Sinharaja Rain-Forest, Ceylon—By John R. Baker.

The Geographical Journal: September 1937.

A Persian Geographer of A.D. 982 on the Orography of Central Asia—By V. Minorsky.

The Scottish Geographical Magazine: July 1937.

Geography and the Civil Engineer—By C. Gillman.

The Scottish Geographical Magazine: September 1937.

Recent and Contemporary Japanese Migration—By T. W. Freeman.

Geography: June 1937.

Reality in Climate: The Results of Recent Microclimatological Studies with Special Reference to Temperatures—By H. A. Mathews.

The Railways of Great Cities—By S. H. Beaver.

A Preliminary Investigation of Children's Comprehension of Geographical Ideas—By T. Herdman.

Geography: September 1937.

Geography and the Scientific Movement—By H. J. Fleure.

The Distribution of Place-Names—By J. Haliczer.

Visual Aids to the Teaching of Geography—By S. G. Davis.

The Geographical Magazine: June 1937.

The Arab Peasants of Palestine—By Constantia Rumbold.

Arctic Summer—By P. G. Mott.

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